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DEPARTMENT OF TRANSPORTATION AND RELATED AGENCIES APPROPRIATIONS FOR 1991

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON APPROPRIATIONS

HOUSE OF REPRESENTATIVES

ONE HUNDRED FIRST CONGRESS

SECOND SESSION

SUBCOMMITTEE ON THE DEPARTMENT OF TRANSPORTATION AND RELATED AGENCIES APPROPRIATIONS

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U.S. Department of
Transportation

BUDGET ESTIMATES

FISCAL YEAR 1991

FEDERAL AVIATION ADMINISTRATION

SUBMITTED FOR USE OF
THE COMMITTEES ON APPROPRIATIONS

FEDERAL AVIATION ADMINISTRATION

Congressional Justification of Estimates of Appropriations for Fiscal Year 1991

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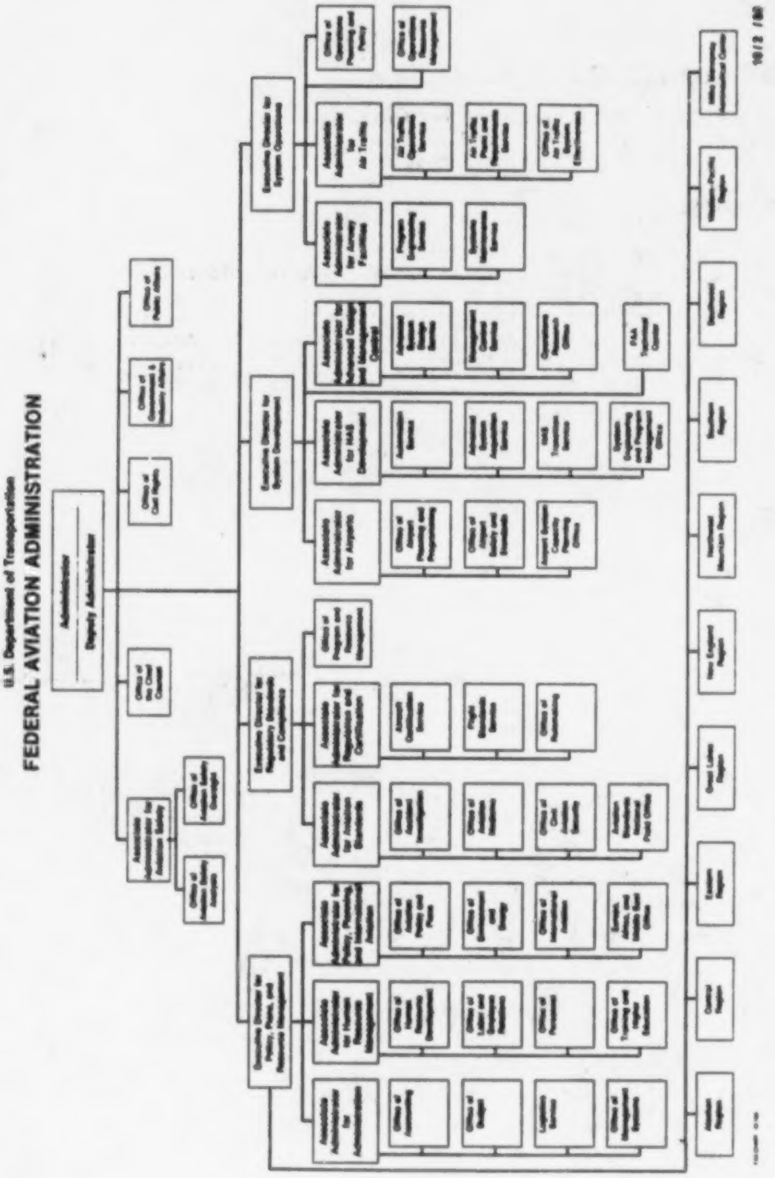

U.S. Department of Transportation
FEDERAL AVIATION ADMINISTRATION
Administrator
Deputy Administrator

FEDERAL AVIATION ADMINISTRATION

GENERAL STATEMENT

Legislative Authority

The Federal Aviation Administration functions as an operating administration within the Department of Transportation pursuant to the Department of Transportation Act, P.L. 89-670.

Aeronautical services are provided by the Federal Aviation Administration under authority of several statutes, the more important of which are identified below.

1. The Federal Aviation Act of 1958 created the Federal Aviation Agency and provides for the regulation and promotion of civil aviation so as to foster its development and safety and to assure the safe and efficient use of the air space by both civil and military aircraft.

2. The International Aviation Facilities Act was enacted to encourage the development of an international air transportation system adapted to the needs of the foreign commerce of the United States, of the postal service and of the national defense, and for other purposes.

3. The Administration proposes amended legislation to continue expansion and improvements to the Nation's airport and airway system, for the imposition of airport and airway user charges and for other purposes.

The declaration of policy for the Administrator, which is Section 103 of the Federal Aviation Act, summarizes effectively the objectives we wish to attain.

> Section 103. In the exercise and performance of his powers and duties under this act, the Administrator shall consider the following, among other things, as being in the public interest.
>
> (a) The regulation of air commerce in such manner as to best promote development and safety and fulfill the requirements of national defense;
>
> (b) The promotion, encouragement, and development of civil aeronautics;
>
> (c) The control of the use of the navigable air space of the United States and the regulation of both civil and military operations in such air space in the interest of the safety and efficiency of both;
>
> (d) The consolidation of research and development with respect to air navigation facilities, as well as the installation and operation thereof;
>
> (e) The development and operation of a common system of air traffic control and navigation for both military and civil aircraft.

Basic Programs

To achieve the objectives set forth in the basic statutes summarized above, FAA conducts the following basic programs.

1. Regulates air commerce to insure safety through the development, promulgation and administration of safety and medical standards, rules and regulations which govern airmen, aircraft, aeronautical operations and related ground support activities; monitors aeronautical activities to assure adherence to regulations and to determine necessary changes in regulations; and processes enforcement actions against those who violate Federal Aviation Regulations.
2. Assure safe and efficient movement of air traffic by providing air navigation services for en route navigation, access to the airway system, guidance in the approach and landing phase of flight; controls the separation of flight in the en route and terminal areas; and furnishes pre-flight and in-flight assistance to pilots.
3. Assists in the development of public airports by making grants-in-aid to localities for airport planning and construction.
4. Carries out other activities designed to facilitate and promote the development of safe and efficient air commerce.

Aviation Industry Indicators

The workload of the Federal Aviation Administration is generated by the activity of all segments of the aeronautical community. Aviation activity is expected to increase in FY 1991, as demonstrated by the following indicators.

	Fiscal Year 1991	
	Amount	%Change
Aviation fuel consumption (billions of gallons)	14.2	+3.6
Revenue passenger miles (billions)	483.2	+5.8
General aviation hours flown (millions)	34.5	+1.5
IFR aircraft handled (millions)	39.1	+3.4
Total operations at airports with FAA towers (millions	64.5	+2.7
IFR operations handled by FAA towers (millions)	48.0	+3.4

1991 Estimates

The fiscal year 1991 request reflects estimates totaling $8,277.7 million in appropriations and obligation limitation, an increase of $1,137.7 million over the FY 1990 enacted level of $7,140 million.

The Operations request of $4,087.7 million reflects an increase of $264.0 million in budget authority over FY 1990. This funding will provide staffing increases in the safety critical workforces (controller workforce, field maintenance technicians, and safety and security inspectors).

The Grants-In-Aid for Airports (Airport and Airway Trust Fund) request establishes a $1,500.0 million obligation limitation in FY 1991 for planning and development of the nation's airports. A liquidating cash appropriation is requested of $1,277.0 million to ensure that sufficient trust fund cash will be available for use in liquidating obligations as they become due.

The Facilities and Equipment (Airport and Airway Trust Fund) request for fiscal year 1991 totals $2,500.0 million. This funding will continue the program to increase the safety, efficiency and capacity of the nation's airway system. Major efforts continue to upgrade the automated capability in terminal air traffic control facilities; provide improved terminal radar systems, modernize and improve air route traffic control center facilities, upgrade or replace air traffic control towers and facilities, and provide new and improved air navigation facilities.

The Research, Engineering and Development (Airport and Airway Trust Fund) request of $190.0 million provides a balance between near-term, rapid development, and long-term research to meet the needs of the National Airspace System (NAS). Major efforts in FY 1991 include human factors, non-destructive testing/inspection of aging aircraft, development of explosive detection laboratory for new/expanded detection of explosives, weapons and flammable liquids and a National Simulation Laboratory to test/demonstrate technology for the ATC system of the 21st century, and integration of weather detection capabilities into the NAS.

The Aviation Insurance Revolving Fund reflects estimated revenue of $3.8 million from fees and investments in U.S. Treasury securities and estimated expenses of $163 thousand. As of September 30, 1989, unfunded contingent liability on 408 aircraft, including hull insurance and personal property liability, is estimated at just under $227.7 billion.

Aircraft Purchase Loan Guarantee Program. The legislative authority to guarantee lenders which is contained in Section 3 of the Act of September 7, 1957, as amended (49 U.S.C. 1324 note), has expired. FY 1991 appropriation language is being proposed to authorize the Secretary to issue notes to the Treasury to finance defaults during FY 1991, not to exceed $57 million for payment of expenses as a consequence of aircraft purchase loan guarantee defaults.

Working Capital Fund. In FY 1991, an amount of $40.7 million from the Operations account will finance services provided through the Department's Working Capital Fund. This is up from $37.4 million in FY 1990.

Consulting Services. For FY 1991, the FAA will require approximately $11.0 million in the Operations appropriation for consulting services support for safety and non-safety related purposes.

Consulting services are necessary to perform studies and other services which would otherwise require additional Federal Government employees. Examples of major consulting services contracts include: development of staffing studies; curriculum development and instructional services; development of the Human Resource Plan for NAS transition; development of the supervisory identification program (SIDP); ADP support for the nationwide General Counsel computer network and contractual litigation support; and other support efforts in such areas of forecasting.

The major program requiring these services are: Air Traffic, Systems Maintenance, Direction, Staff, and Supporting Services, and Human Resources Management.

Federal Aviation Administration
Drug-Related Budget Estimate

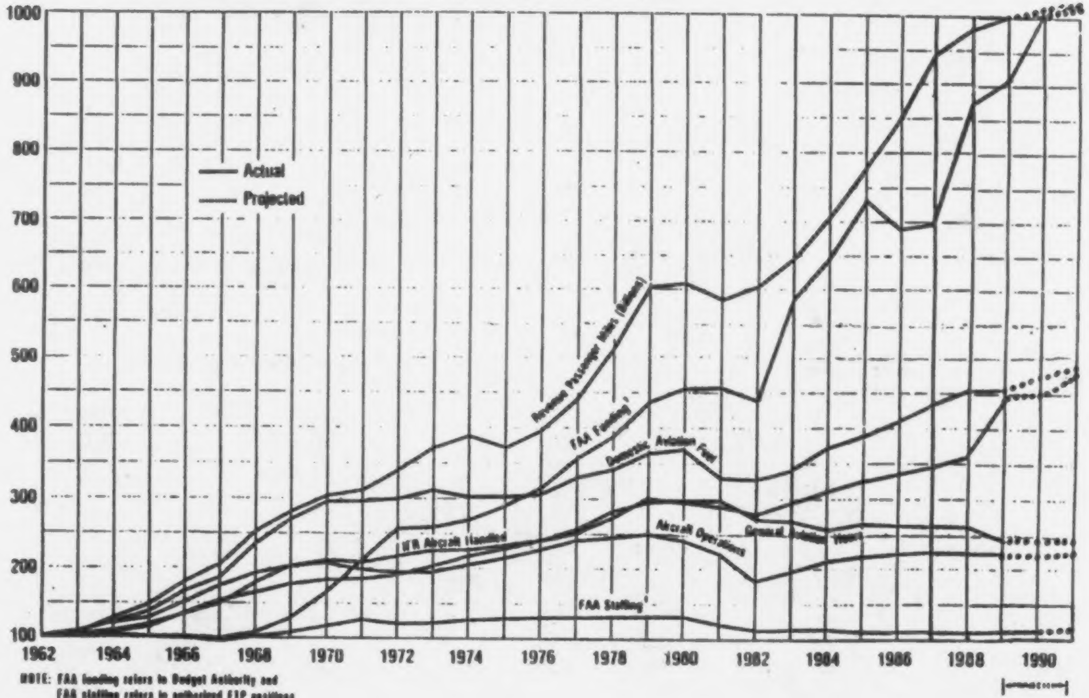
	FY 1989			FY 1990			FY 1991		
	$000	Positions	FTE	$000	Positions	FTE	$000	Positions	FTE
OPERATIONS:									
Air Traffic, FSS	2,700	36	30	4,600	56	44	4,830	56	44
Aviation Stds, Medical	1,292	24	22	5,452	39	32	5,452	45	42
Aviation Stds, Security	550	15	9	1,325	33	24	1,900	33	33
Aviation Stds, RS&A 1/	0	0	0	0	0	0	3,126	43	22
Human Resources Mgmt	3,000	14	14	7,100	14	14	7,700	14	14
TOTAL OPERATIONS DRUG PROGRAM	7,542	89	75	18,477	142	114	23,008	191	155
FACILITIES & EQUIPMENT									
Renovation of Airmen and Aircraft Reporting System, FY 1991 Budget Item #5.c.(13)	0	0	0	3,900	0	0	10,000	0	0
TOTAL	7,542	89	75	22,377	142	114	33,008	191	155

1/ Total program level of $3.1 million is expected to maintain the Aircraft and Registry Reporting System of which $1.6 million will come through user fee collections and $1.4 million from direct budget authority (Operations Appropriation).

INDEX OF COMPARATIVE RATES OF GROWTH: 1962-1991

FAA AND REPRESENTATIVE AVIATION ACTIVITY MEASURES

FISCAL YEAR 1962 = 100



NOTE: FAA funding refers to Budget Authority and FAA staffing refers to authorized FTP positions
¹Excludes Aviation Insurance

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

SUMMARY OF BUDGET ESTIMATES
Fiscal Year 1991

(Dollars in Thousands)

	FY 1990 Enacted		FY 1991 Estimate		Difference	
	Positions	Amount	Positions	Amount	Positions	Amount
General Funds:						
Operations	50,196	$3,016,424	51,162	$1,241,700	966	-1,774,724
Aircraft Purchase Loan Guarantee	0	148	0	150	0	2
Total, General Funds	50,196	3,016,572	51,162	1,241,850	966	-1,774,722
Public Enterprise Funds:						
Aviation Revolving Fund	2	0	2	0	0	0
	2	0	2	0	0	0
Trust Funds:						
Grants-in-Aid for Airports:						
Contract Authority	0	1,651,200	0	1,800,000	0	148,800
Liquidation of Contract Authority	0	[1,190,000]	0	[1,277,000]	0	[87,000]
Facilities and Equipment	1,368	1,721,171	1,743	2,500,000	375	778,829
Research, Engineering and Development	645	170,183	668	190,000	23	19,837
Operations	0	807,181	0	2,846,000	0	2,038,819
Total, Trust Fund	2,013	4,349,715	2,411	7,336,000	398	2,986,285
TOTAL, BUDGET ESTIMATES	52,211	7,366,287	53,575	8,577,850	1,364	1,211,563

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

SUMMARY OF AUTHORIZED POSITIONS AND EOY EMPLOYMENT
Fiscal Year 1991

	POSITIONS (FULL-TIME PERMANENT)			END-OF-YEAR EMPLOYMENT (IN FULL-TIME PERMANENT POSITIONS)		
	1989	1990	1991	1989	1990	1991
Direct Funded By Appropriation						
Operations	48,474	50,196	51,162	47,197	48,422	49,498
Facilities and Equipment	1,162	1,368	1,743	1,276	1,313	1,673
Research, Engineering and Development	645	645	668	597	613	635
Aviation Insurance Revolving Fund	2	2	2	1	2	2
Subtotal, Direct Funded	50,283	52,211	53,575	49,071	50,350	51,808
Reimbursements and Allocations						
Operations	427	500	500	355	427	500
Facilities and Equipment	55	53	55	53	53	55
Research, Engineering and Development	6	6	6	6	6	6
Subtotal, Reimbursement and Allocations	488	559	561	414	486	561
TOTAL	50,771	52,770	54,136	49,485	50,836	52,369

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

SUMMARY OF FTE CEILING

	1989	1990	1991
Direct Funded By Appropriation			
Operations	46,733 1/	48,525 1/	49,993 1/
Facilities and Equipment	1,302	1,326	1,514
Research, Engineering and Development	670	673	698
Aviation Insurance Revolving Fund	2	2	2
Subtotal, Direct Funded	48,707	50,526	52,207
Reimbursements and Allocations			
Operations	335	500	500
Facilities and Equipment	54	53	55
Research, Engineering and Development	6	6	6
Subtotal, Reimbursement and Allocations	395	559	561
TOTAL FTE	49,102	51,085	52,768

1/ These numbers exclude 210 nonceiling FTE for FY 1989, 223 nonceiling FTE for FY 1990, and 236 nonceiling FTE for FY 1991.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Operations
(Including Transfer of Funds)

For necessary expenses of the Federal Aviation Administration, not otherwise provided for, including administrative expenses for research and development, [and for] establishment of air navigation facilities and the operation and maintenance of aircraft, and carrying out the provisions of the Airport and Airway Development Act, as amended, or other provisions of law authorizing the obligation of funds for similar programs of airport and airway development or improvement, purchase of four passenger motor vehicles for replacement only, [$3,842,000,000] $4,087,700,000 of which [$816,500,000] $2,846,000,000 shall be derived from the Airport and Airway Trust Fund: Provided, That there may be credited to this appropriation funds received from States, counties, municipalities, other public authorities, and private sources, for expenses incurred in the maintenance and operation of air navigation facilities and for issuance of airmen and aircraft certificates, including processing of major repair and alteration forms: Provided further, That none of these funds shall be available for new applicants for the second career training program [or for a pilot test of contractor maintenance: Provided further, That the immediately preceding proviso shall not prohibit the augmentation of the existing field maintenance work force if it is determined to be essential for the safe operation of the air traffic control system: Provided further, That the unexpended balances of the appropriation "Federal Aviation Administration, Headquarters Administration" shall be transferred to and merged with his appropriation]: Provided further, That 5 U.S.C. 5532(f)(2) is amended by striking "December 31, 1989" and inserting "December 31, 1991" in lieu thereof: Provided further, That 5 U.S.C. 8344(h) is amended by striking "December 31, 1987" in paragraph (2) and inserting "December 31, 1989" in lieu thereof: Provided further, That in the event that the Federal Aviation Administrator [employs] reemploys annuitants subject to section 8344(h) of title V. United States Code, not to exceed $10,000,000, to be derived from the unobligated balance of any appropriation available for obligation by the Federal Aviation Administration as of the effective date of this Act, shall be available through December 31, [1990] 1991 for the purpose of funding such employment: Provided further, That any such funding shall be reported to the Committees on Appropriations of the Senate and the House of Representatives [:Provided further, That of the funds available under this head, $3,400,000 shall be made available for the Federal Aviation Administration to enter into contractual agreement with the Mid-American Aviation Resource Consortium in Minnesota to operate an air traffic controller training program]. (Department of Transportation and Related Agencies Appropriations Act, 1990; additional authorizing legislation to be proposed for $2,846,000,000).

STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS
Program and Financing (in thousands of dollars)

Identification code 69-1301-0-1-402	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
Direct program:			
00.01 Operation of traffic control system	1,558,063	1,712,868	1,853,241
00.02 NAS logistics support	192,890	206,304	217,162
00.03 Maintenance of traffic control system	660,106	713,700	751,172
00.04 Leased telecommunications services	244,298	267,638	283,861
00.05 Administration of aviation standards programs	369,292	421,266	470,438
00.06 Development direction	11,233	14,921	15,321
00.07 Administration of airports program	33,849	37,716	38,920
00.08 Direction, staff and supporting services	110,600	128,857	130,961
00.09 Human resource management	233,315	290,120	296,086
00.10 Headquarters administration	36,337	30,949	31,838
00.19 Management Initiatives	.....	.....	-1,300
00.91 Total direct program	3,449,983	3,824,339	4,087,700
01.01 Reimbursable program	38,994	42,000	45,000
10.00 Total obligations	3,488,977	3,866,339	4,132,700

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS
Program and Financing (in thousands of dollars)

Identification code 69-1301-0-1-402	19 89 actual	19 90 estimate	19 91 estimate
Financing:			
Offsetting Collections from:			
11.00 Federal funds............	-26,126	-28,100	-30,200
13.00 Trust funds...............	-476,920	-807,181	-2,846,000
14.00 Non-Federal sources.......	-13,588	-13,900	-14,800
17.00 Recovery of prior year obligations..............	-317	.....	....
21.40 Unobligated balance available, start of year.	-417	-734	....
24.40 Unobligated balance available, end of year....................	734	.....	....
25.00 Unobligated balance lapsing................	1,387	.....	....
39.00 Budget authority.........	2,973,730	3,016,424	1,241,700
Budget authority:			
40.00 Appropriation.............	2,973,730	3,025,500	1,241,700
40.00 Reduction pursuant to P.L. (101-164)................	....	-9,076	....
43.00 Appropriation (adjusted)..	2,973,730	3,016,424	1,241,700
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July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS
Program and Financing (in thousands of dollars)

Identification code 69-1301-0-1-402	19 89 actual	19 90 estimate	19 91 estimate
Relation of obligations to outlays:			
71.00 Obligations incurred, net..	2,972,342	3,017,158	1,241,700
72.40 Obligated balance, start of year....................	411,089	453,212	461,151
74.40 Obligated balance, end of year....................	-453,212	-461,151	-490,551
77.00 Adjustments in expired accounts...............	-15,850	....	....
78.00 Adjustments in unexpired accounts................	-317	....	....
90.00 Outlays..................	2,914,052	3,009,219	1,212,300
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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS

PROGRAM AND PERFORMANCE

The primary purpose of this account to operate and maintain a safe and efficient national aviation system. This account finances the personnel and support costs of operating and maintaining the air traffic control system and ensuring the safety and security of aircraft, flight procedures, navigation aids, and airports through periodic inspections. It also supports overall policy direction and guidance.

For 1991, the budget proposes continuing increases in the FAA workforce to meet increasing demands. Specifically, the budget requests workforces of 17,495 for air traffic controllers, an increase of 495 over 1990, 9,539 field maintenance technicians, an increase of 260 over 1990; 3,853, for aviation safety inspectors and support personnel, an increase of 400 over 1990, and 848 for civil aviation security specialists, and increase of 164 over 1990. These increases will allow the FAA to keep pace with expected increases in air traffic activity; to cover increased workload due to implementation of the NAS plan and to augment its safety enforcement and security efforts.

The budget will also support continued emphasis on upgrading the FAA's training and recruitment programs; ongoing drug testing and drug interdiction efforts; and savings due to management efficiencies.

In FY 1991, the budget proposes that 85% of the cost of this Operations Appropriation be funded out of the Airport and Airway Trust Fund. This means that the trust fund will help pay for the salaries and related expenses of the FAA's critical safety employees who have the daily responsibility of ensuring the safety of the flying public.

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS
Object Classification (in thousands of dollars)

Identification code 69-1301-0-1-402	19 89 actual	19 90 estimate	19 91 estimate
Direct obligations: Personnel compensation:			
11.1 Full-time permanent.......	1,822,675	1,984,352	2,138,864
11.3 Other than full-time permanent...............	24,185	24,908	26,407
11.5 Other personnel compensation............	208,274	234,188	250,302
11.8 Special personal services payments................	295	679	575
11.9 Total personnel compensation.........	2,055,429	2,244,127	2,416,148
12.1 Civilian personnel benefits.................	459,516	523,557	572,354
13.0 Benefits for former personnel................	1,247	1,241	1,243
21.0 Travel and transportation of persons..................	86,169	103,562	105,052
22.0 Transportation of things...	21,882	23,094	24,105
23.1 Rental payments to GSA.....	29,938	38,011	45,406
23.2 Rental payments to others..	35,657	37,286	38,462
23.3 Comm., utilities and misc. charges..................	285,433	305,445	326,389
24.0 Printing and reproduction..	12,796	11,869	12,431
25.0 Other services.............	352,765	429,245	438,162
26.0 Supplies and materials.....	71,672	73,111	75,632
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Cap 210

STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS
Object Classification (in thousands of dollars)

Identification code 69-1301-0-1-402	19 89 actual	19 90 estimate	19 91 estimate
31.0 Equipment..................	36,303	33,306	31,800
32.0 Lands and structures.......	777	119	120
42.0 Insurance claims and indemnities...............	399	366	396
99.0 Subtotal, direct obligations...........	3,449,983	3,824,339	4,087,700
99.0 Reimbursable obligations....	38,994	42,000	45,000
99.9 Total obligations.........	3,488,977	3,866,339	4,132,700
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STANDARD FORM 300
July [illegible], Bureau of the Budget
Circular No. A-11, Revised.
[illegible]

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS
Personnel Summary

Identification code 69-1301-0-1-402	19 89 actual	19 90 estimate	19 91 estimate
Direct:			
Total number of full-time permanent positions...........	48,474	50,196	51,162
Total compensable workyears:			
Full-time equivalent employment..................	46,943	48,748	50,229
Full-time equivalent of overtime and holiday hours..	1,233	1,253	1,267
Reimbursable:			
Total number of full-time permanent positions...........	427	500	500
Total compensable workyears:			
Full-time equivalent employment..................	335	500	500
Full-time equivalennt of overtime and holiday hours...........	8	8	8
([illegible])	([illegible])	([illegible])	([illegible])

APPROPRIATION SUMMARY
FEDERAL AVIATION ADMINISTRATION
OPERATIONS
($ 000)

	FY 1989 Appropriated Estimated	FY 1990 Estimated	FY 1991 Base Changes			FY 1991 Base Level	FY 1991 Changes		FY 1991 Request Level
			Management Savings Annualization	Other Savings, Budgeted or non-Discr.	Price Level, Annualization, and Other Increases		Other Proposed (Discr'nry) Program Reductions	Recommended Program Increases	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(9)	(10)
DOLLAR RESOURCES									
Budget Authority	3,445,049 1/	3,823,605	0	0	288,510	4,112,115	(58,871)	34,456	4,087,700
Program Level	3,449,983	3,824,339	0	0	288,510	4,112,849	(58,871)	33,722	4,087,700
Outlays	3,391,506	3,816,404	0	0	256,774	4,073,178	(58,871)	43,993	4,058,300
STAFFING									
FTP POS	48,474	50,196	0	0	140	50,336	(300)	1,126	51,162
FTE - Total (Subj to Ceiling)	46,733	48,525	0	0	821	49,346	(200)	847	49,993

1/ The budget authority, program level, and outlay figures in this column include a $5,600,000 transfer from F&E and $734,000 of no year funds.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS APPROPRIATION

	Dollar Resources ($000)			Staffing			
					Ceiling FTE		
	PC&B	Other Objects	Total	FTP Pos.	Total	FTP	OTFTP
1.FY 1989 Actual....................	$2,516,192	$933,791	$3,449,983	48,474	46,733	46,009	724
2.FY 1990 Program Level.............	2,768,925	1,055,414	3,824,339	50,196	48,525	47,794	731
3.Price Level, Annualization and other non-discretionary changes.........................	196,972	91,538	288,510	140	821	821	0
4.Program Reductions (Discretionary)................	(8,495)	(50,376)	(58,871)	(300)	(200)	(200)	0
5.Recommended Program Increases.....	32,343	1,379	33,722	1,126	847	847	0
6.FY 1991 Request Level.............	$2,989,745	$1,097,955	$4,087,700	51,162	49,993	49,262	731

DEPARTMENT OF TRANSPORTATION

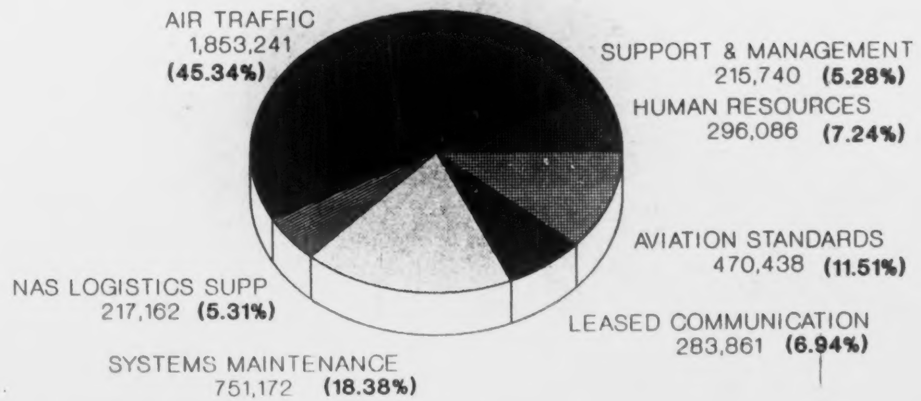
FEDERAL AVIATION ADMINISTRATION

SUMMARY OF PROGRAM REQUIREMENTS

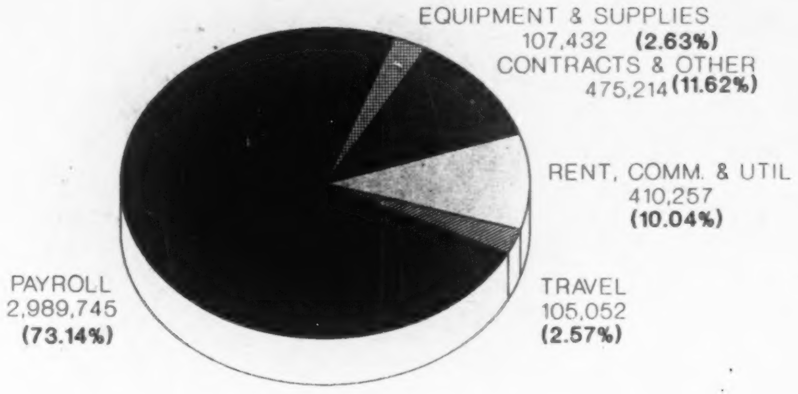
OPERATIONS
(Dollars in Thousands)

	1990 Program Level		FY 1991 Estimate		Difference	
	Positions	Amount	Positions	Amount	Positions	Amount
Operation of Traffic Control System	27,933	1,712,868	27,791	1,853,241	(142)	140,373
NAS System Logistics Support	1,525	206,304	1,579	217,162	54	10,858
Maintenance of Traffic Control System	10,445	713,700	10,736	751,172	291	37,472
Leased Telecommunications Services	0	267,638	0	283,861	0	16,223
Administration of Aviation Standards Program	6,673	421,266	7,336	470,438	663	49,172
Development Direction	140	14,921	150	15,321	10	400
Administration of Airports Program	521	37,716	530	38,920	9	1,204
Direction, Staff and Supporting Services	1,166	128,857	1,180	130,961	14	2,104
Human Resource Management	1,398	290,120	1,460	296,086	62	5,966
Headquarters Administration	395	30,949	400	31,838	5	889
Management Initiatives	0	0	0	(1,300)	0	(1,300)
TOTAL	50,196	3,824,339	51,162	4,087,700	966	263,361

OPERATIONS APPROPRIATION
FY 1991 BUDGET BY MAJOR ACTIVITY
(Dollars in Thousands)



OPERATIONS APPROPRIATION
FY 1991 BUDGET BY MAJOR OBJECT CLASS
(Dollars in Thousands)



DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

OPERATIONS

The Operations appropriation provides funding for the operation, maintenance, communications and logistics support of the air traffic control and navigational systems; the certification and safety inspection of aircraft and airmen; the development and enforcement of regulations in the areas of security, medical fitness of airmen and airport development; the direction and administration of the airport grant program, research and development program; and several other management and support functions.

The overall objectives of the Operations appropriation are:

o To regulate air commerce in a way that will promote its development and safety while fulfilling the requirements of national defense;

o To control the use of navigable airspace and regulate both civil and military operations in the interest of safety and efficiency;

o To promote and encourage the development of civil aeronautics;

o To maintain and operate air traffic and air navigation facilities; to coordinate research and development related to these facilities;

o To develop and implement programs and regulations to control aircraft noise, sonic boom, and other environmental effects of civil aviation.

AIR TRAFFIC

Continued national prosperity and the increased desire of the American people to travel by air have resulted in the air traffic control system handling an unprecedented number of flights. In FY 1991, the FAA will operate an estimated 399 air traffic control towers (ATCT) and 24 air route traffic control centers (ARTCC) to handle a daily average of 176,712 takeoffs and landings and 131,507 instrument operations, and will provide 123,288 flight services. The system is also responsible for the safety of a daily average of 1,317,534 revenue passengers (in 1989) in the United States. As of September 30, 1989, the FAA will operate 161 flight service stations (FSS) and 46 automated flight service stations (AFSS).

One of the FAA's highest and essential priorities is to ensure that the controller work force (CWF) keeps pace with growth in air traffic while ensuring that flying remains one of the safest and most efficient forms of transportation. For FY 1991, we propose a controller work force of 17,495. The FAA uses several factors in determining the number of controllers to include in its budget. These factors include, but are not limited to, staffing standards employing forecasts of aviation activity, the number of controllers in training and not available during the budget year for air traffic control, and an estimate of the number of additional sectors and control positions that may be required once operational details are developed in the budget year (e.g., TCA's, ARSA's). It must be understood that the FAA and the airlines cannot predict 18 to 24 months in advance when new routes or hubs may be established and what the precise effect of those actions would have on the controller work force staffing requirements.

NAS LOGISTICS SUPPORT

For FY 1991 we expect another year of intense logistics activity supporting new and current NAS Plan systems. The net requested increase for this activity is $10,858,000 and 4 positions. Workload in this activity is a direct result of ensuring the effective and efficient logistical support of air traffic and air navigational control facilities. This logistical support provides for the acquisition, warehousing, distribution, and transportation of real and personal property, as well as maintenance of the FAA's Technical Center and Aeronautical Center.

SYSTEMS MAINTENANCE

The number of facilities that must be maintained is estimated to rise to 25,560 in FY 1991. This increase includes a number of major systems such as the Next Generation Weather Radar (NEXRAD), and the Automated Weather Observation System (AWOS). An increase of 291 positions will bring the field maintenance work force up to approximately 88 percent of the staffing standard, help meet the increased requirements of the Telecommunications Management and Operations function and accommodate the increased NAS Plan workload.

LEASED TELECOMMUNICATIONS SERVICES

Over the last several years, the leased telecommunications rates have risen dramatically, including increases of more than twice the rate of inflation. In order to combat these increases, very aggressive cost controls have been undertaken, including replacing large numbers of circuits with more cost-effective service such as the FAA-owned Radio Communication Link, NADIN and data multiplexing networks. In addition, major leased systems were purchased with Facilities and Equipment funds, thereby eliminating lease costs. Also, management reviews of both new and existing requirements have controlled program growth.

AVIATION STANDARDS

An increase is requested for 300 additional aviation safety inspectors and 100 support personnel for the Operations and Maintenance subactivity of the Aviation Standards Program to perform critical safety inspections and surveillance required to maintain safe air commerce in an expanding, economically deregulated environment. One hundred sixty-four additional positions are required for special agents and administrative support personnel to enhance domestic Civil Aviation Security programs as well as to support foreign airport assessments and Federal Air Marshal missions. Thirty-five positions for manufacturing inspectors and aerospace engineers in the Aircraft Certification subactivity are requested.

DEVELOPMENT DIRECTION

The Development Direction activity provides for planning, monitoring, and coordination of the FAA's research, development, engineering, and test and evaluation programs (excluding Aviation Medicine). This activity also supports technical and administrative program management associated with the implementation and modernization of the FAA's $15.8 billion NAS Plan. This activity also supports efforts associated with NAS modernization.

AIRPORTS

The Airports program covers the identification, planning, development, and safety certification of the Nation's system of public airports to serve the needs of civil aviation in the 50 states and territories. An increase of 9 positions is required to administer this program in FY 1991.

DIRECTION, STAFF AND SUPPORTING SERVICES

Increased staffing in the areas of air traffic, safety inspectors, security personnel, etc. have placed a much greater workload on all support activities. An increase of 14 positions is required to support this workload in FY 1991.

HUMAN RESOURCE MANAGEMENT

In FY 1991, FAA will conduct approximately 123,030 student weeks of training, and will recruit, train, and promote approximately 3,000 new air traffic controllers, 300 aviation safety inspectors, and 900 airway facilities field maintenance personnel. Traditional personnel services,such as reassignments, promotions, job classifications, position description, appeals and grievances, labor contract negotiations, and administration will be provided for a work force of approximately 54,000. The net increase requested for this activity is 62 positions and $5,966,000.

This budget continues the FAA's emphasis on human resource management, including the employment of organizational interventions, improved and integrated career management and selection systems, and collaborative, participative management processes. It also continues targeted programs to develop and adopt improved and modern recruitment and training systems, as described in the agency's major training initiative. "The Flight Plan for Training."

HEADQUARTERS ADMINISTRATION

The Headquarters Administration Program funds the Washington Headquarters administrative functions that establish policy and direct and develop programs which provide the following administrative services; Policy and Plans, Accounting, Budget, Civil Rights, International Aviation, Management Systems, and Data Systems. An increase of 5 positions is required to administer this program in FY 1991.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS APPROPRIATION

PERMANENT CHANGE OF STATION
(DOLLARS IN THOUSANDS)

PROGRAM	FY 1989		FY 1990		FY 1991	
	NO. OF MOVES	TOTAL COST	NO. OF MOVES	TOTAL COST	NO. OF MOVES	TOTAL COST
Air Traffic	1,405	$35,675	1,400	$40,000	1,350	$45,000
NAS Logistics	26	741	25	741	25	741
Systems Maintenance	444	12,901	480	13,934	480	14,394
Leased Telecommunications	0	0	0	0	0	0
Regulatory Standards & Compliance:						
Certification	26	762	40	1,162	40	1,172
O&M	190	5,732	108	3,595	108	3,595
RS&A	0	0	0	0	0	0
PD&E	5	247	0	0	0	0
Aircraft	44	1,069	51	1,423	51	1,440
Security	16	567	28	984	29	1,004
Medical	5	172	1	43	1	43
Aviation Standards	286	8,549	228	7,207	229	7,254
Aviation Safety	0	0	4	311	6	518
Development Direction	2	60	5	300	7	475
Airports	11	514	11	526	12	550
Direction Staff & Support Services	21	800	21	822	21	822
Human Resource Management	117	3,151	138	4,151	138	4,181
Headquarters Administration	9	446	7	410	7	410
TOTAL	2,321	$62,837	2,319	$68,402	2,275	$74,345

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS APPROPRIATION
Operation of Traffic Control System

	Dollar Resources ($000)			Staffing			
					Ceiling FTE		
	PC&B	Other Objects	Total	FTP Pos.	Total	FTP	OTFTP
1. FY 1989 Actual	$1,450,767	$107,296	$1,558,063	27,150	26,247	25,895	352
2. FY 1990 Program Level	1,596,920	115,948	1,712,868	27,933	27,100	26,748	352
3. Price Level, Annualization and other non-discretionary changes	121,871	11,708	133,579	0	250	250	0
4. Program Reductions (Discretionary)	(8,350)	0	(8,350)	(300)	(200)	(200)	0
5. Recommended Program Increases	14,644	500	15,144	158	496	496	0
6. FY 1991 Request Level	$1,725,085	$128,156	$1,853,241	27,791	27,646	27,294	352

OPERATIONS APPROPRIATION

Operation of Traffic Control System

General Justification

For FY 1991, the operation of the Air Traffic Control System will require $1,853,241,000, 27,791 FTP positions, and 27,646 FTE's. This represents an increase of $140,373,000, an increase of 546 FTE's, and a decrease of 142 positions compared to the FY 1990 level.

There will be a decrease of 200 positions as closing/consolidating flight service stations occur when automated flight service stations are commissioned. An additional decrease of 100 positions is due to the phase out of air traffic assistants at centers and terminals.

This activity covers the operation of a national system of air traffic control and flight service facilities to assure safety, reliability, and regularity of flight operations. In FY 1991, the FAA will operate 24 air route traffic control centers (ARTCC) and an estimated 399 air traffic control towers (ATCT) to handle a daily average of 176,712 takeoffs and landings and 131,507 instrument rule flights, and provide 123,288 flight services. The system is also responsible for the safety of a daily average of 1,317,534 revenue passengers (in 1989) in the United States. As of September 30, 1989, FAA operated 161 non-automated flight service stations (FSS) and 46 automated flight service stations (AFSS).

The operation of the Air Traffic Control System consists of four major subactivities:

Air Route Traffic Control Centers

The major elements are the operation of en route air traffic control, long-range radar, NAS Stage A computers (HOST), and direct controller-pilot voice communications. The objective of the en route traffic control system is to provide for safe, orderly, and expeditious movement of the instrument flight rule (IFR) air traffic along the airways and in positive control areas.

Airport Traffic Control Towers

The major elements are the operation of airport surveillance radar, automated radar terminal systems computers, approach lighting, instrument landing systems, and various visual aids and radio navigation facilities. The objective of the terminal air traffic control system is to provide for safe, orderly, and expeditious movement of air traffic in the vicinity of the airport.

OPERATIONS APPROPRIATION

Operation of Traffic Control System

General Justification

Flight Service Stations

The major elements are the operation of an extensive network of landline teletypewriter circuits, point-to-point radio circuits, air-ground radio channels and related equipment for the exchange of air traffic control information, weather information, and for flight assistance services. The objectives of flight service stations are: (1) the provision of flight assistance (pre-flight, in-flight, and emergency); and (2) the collection and distribution of meteorological and aeronautical information.

Planning, Direction, and Evaluation

This subactivity provides top level management and direction of the air traffic control system. Functions include the development of standardized air space and procedures for operation of the air traffic control system, support and maintenance of the air traffic control computer operational software, evaluation of air traffic operations' safety and efficiency and centralized management of the air traffic flow management system. Included are personnel at Washington headquarters, the National Communications Center (NATCOM) in Kansas City, MO, the National Flight Data Center (NFDC) in Washington, DC, the Centralized Programming Group (CPG) at the Technical Center in Atlantic City, NJ, as well as evaluation personnel in the Seattle, Ft. Worth, and Atlanta regional divisions who manage, direct, and evaluate the day-to-day operations of the system.

The primary changes proposed for FY 1991 are an increase of 496 FTE's required to bring the controller work force to the 17,495 level by the end of FY 1991, an increase for permanent change-of-station moves to ensure that qualified controllers are placed at our busiest facilities, and an increase of 158 positions planned for technical support.

The 1990's will see a dramatic change in the air traffic control system. New equipment and software costing some $11 billion will be coming on line. These capital investments will ultimately provide significant user savings through increased productivity of the controller work force and reduced cost of operating in the air traffic control environment. To realize these efficiencies, FAA must increase the level of effort in developing procedures, modifying the airspace, training personnel and monitoring, analyzing and evaluating the impact of existing and proposed changes. It also provides for the extensive changes in airspace redesign and ATC system software changes required as a result of changing airspace management practices and the new NAS Plan equipment to be delivered in the FY 1990-FY 1994 period. Thus airspace redesign and software changes must be completed prior to equipment delivery.

OPERATIONS APPROPRIATION

Operation of Traffic Control System

Operational Activity Based on FAA Aviation Forecasts, Office of Aviation Policy*

Volume of Activity (In Millions)

Facility		Actual**			Forecast***				-----Percentage Change-----			
		1987	1988	1989	1990	1991	1992	1993	1987 1988	1988 1989	1990 1991	1990 1993
Centers	IFR Aircraft Handled	35.8	36.4	36.6	37.8	39.1	40.1	41.0	1.68%	0.55%	3.44%	8.47%
Towers	Aircraft Operations	61.0	61.3	61.4	62.8	64.5	66.5	67.7	0.49%	0.16%	2.71%	7.80%
	Instrument Operations	43.4	44.5	45.0	46.4	48.0	49.6	50.8	2.53%	1.12%	3.45%	9.48%
Stations	Flight Services	47.7	44.8	45.0	44.9	45.0	45.1	45.3	-6.08%	0.45%	0.22%	0.89%
	General Aviation Hours Flown	33.6	33.5	33.9	34.0	34.5	35.2	35.5	-0.30%	1.19%	1.47%	4.41%

* In addition to standard forecasts, FAA also uses other factors to determine CWF Staffing levels. These may include number of controllers in training and an estimate of the number of additional sectors, etc.

** Prior year (FY 1989) data is provided as an estimate. Changes in FY 1988 data are corrections to estimates provided in FY 1990 President's Budget.

*** Forecast data from FAA Aviation Forecasts, Fiscal Years 1990-2001, FAA-APO 90-1, March 1990.

OPERATIONS APPROPRIATION

Operation of Traffic Control System

Overtime ($000)		FY 1987 Actual	FY 1988 Actual	FY 1989 Actual	FY 1990 Estimate	FY 1991 Estimate
Centers	- Hours	429,000	367,000	268,000	266,000	255,000
	Amount	$11,590	$10,618	$9,637	$9,560	$9,208
Towers	- Hours	341,000	359,000	286,000	284,000	272,000
	Amount	$9,359	$10,533	$9,568	$9,508	$9,158
Stations	- Hours	170,000	127,000	106,000	104,000	100,000
	Amount	$3,416	$2,616	$2,438	$2,391	$2,303
PD&E	- Hours	10,000	13,000	15,000	15,000	14,000
	Amount	$164	$235	$280	$284	$274
Total	- Hours	950,000	866,000	675,000	669,000	641,000
	Amount	$24,529	$24,002	$21,923	$21,743	$20,943

Notes:

1. Overtime hours have been rounded up/down to the nearest thousand.
2. Actual overtime hours per subactivity are based on payroll and actual obligation data.
3. Estimated overtime hours and dollars are based on cost data projected by the FAA regional offices and on adjusted rate data.

OPERATIONS APPROPRIATION

Operation of Traffic Control System

Resource Summary ($000)

		FY 1987	FY 1988	FY 1989	(Est.) FY 1990	Proposed Change	(Est.) FY 1991
Centers -	PC&B	$495,302	$534,121	$587,132	$646,192	$60,067	$706,259
	O.O.	9,265	9,495	10,208	8,536	551	9,087
	TOTAL	$504,567	$543,616	$597,340	$654,728	$60,618	$715,346
Towers -	PC&B	$505,006	$555,121	$612,825	$675,847	$59,356	$735,203
	O.O.	9,813	9,489	10,097	14,430	922	15,352
	TOTAL	$514,819	$564,610	$622,922	$690,277	$60,278	$750,555
Stations -	PC&B	$190,468	$189,406	$195,478	$217,490	$7,794	$225,284
	O.O.	8,573	10,977	13,867	13,437	470	13,907
	TOTAL	$199,041	$200,383	$209,345	$230,927	$8,264	$239,191
PD&E -	PC&B	$48,100	$50,743	$55,332	$57,391	$948	$58,339
	O.O.	42,335	73,827	73,124	79,545	10,265	89,810
	TOTAL	$90,435	$124,570	$128,456	$136,936	$11,213	$148,149
TOTAL -	PC&B	$1,238,876	$1,329,391	$1,450,767	$1,596,920	$128,165	$1,725,085
	O.O.	69,986	103,788	107,296	115,948	12,208	128,156
	TOTAL	$1,308,862	$1,433,179	$1,558,063	$1,712,868	$140,373	$1,853,241

OPERATIONS APPROPRIATION

Operation of Traffic Control System — Staffing Information

FTP Positions	FY 1987	FY 1988	FY 1989	(Est.) FY 1990	Proposed Change	(Est.) FY 1991
Centers	9,479	9,539	9,945	10,360	(26)	10,334
Towers	10,370	11,280	11,904	12,259	20	12,279
Stations	4,351	4,392	4,344	4,400	(200)	4,200
PD&E	1,013	1,009	957	914	64	978
TOTAL	25,213	26,220	27,150	27,933	(142)	27,791
Total Direct Ceiling FTE's						
Centers	9,308	9,462	9,827	9,904	403	10,307
Towers	9,991	10,669	11,243	11,988	259	12,247
Stations	4,389	4,289	4,248	4,294	(128)	4,166
PD&E	904	922	929	914	12	926
TOTAL	24,592	25,342	26,247	27,100	546	27,646
End of Year Employment Information						
Centers	9,588	9,279	10,068	9,931	240	10,171
Towers	10,214	11,011	11,354	11,988	159	12,147
Stations	4,211	4,149	4,133	4,180	(190)	3,990
PD&E	918	961	961	868	0	868
TOTAL	24,931	25,400	26,516	26,967	209	27,176

OPERATIONS APPROPRIATION

Operation of Traffic Control System — Employment Information

	FY 1987	FY 1988	FY 1989	(Est.) FY 1990	Proposed Change	(Est.) FY 1991
CENTERS:						
CWF	7,785	7,445	7,626	7,702	336	8,038
Traffic Mgmt. Coord.	223					
Area Supervisors	739					
Managers	283	295	320	325	0	325
Specialists	198	209	261	283	0	283
Air Traffic Assistants		685	697	712	(96)	616
Other Support/Trainees	360	645	1,164	909	0	909
Total	9,588	9,279	10,068	9,931	240	10,171
TOWERS:						
CWF	7,648	8,991	9,206	9,298	159	9,457
Traffic Mgmt. Coord.	23					
Area Supervisors	1,135					
Managers	647	558	578	628	0	628
Specialists	446	506	567	617	0	617
Air Traffic Assistants		610	615	656	0	656
Other Support/Trainees	315	346	388	789	0	789
Total	10,214	11,011	11,354	11,988	159	12,147

OPERATIONS APPROPRIATION

Operation of Traffic Control System

Employment Information

	FY 1987	FY 1988	FY 1989	(Est.) FY 1990	Proposed Change	(Est.) FY 1991
STATIONS:						
Area Supervisors	397	409	390	392	0	392
Managers	396	360	349	351	(10)	341
Specialists	3,309	3,249	3,262	3,304	(180)	3,124
Other Support/Trainees	109	131	132	133	0	133
Total	4,211	4,149	4,133	4,180	(190)	3,990
PD&E:						
Total Support	918	961	961	868	0	868
TOTAL AIR TRAFFIC:						
CWF	15,433	16,436	16,832	17,000	495	17,495
Traffic Mgmt. Coord.	246					0
Area Supervisors	2,271	409	390	392	0	392
Managers	1,326	1,213	1,247	1,304	(10)	1,294
Specialists	3,953	3,964	4,090	4,204	(180)	4,024
Air Traffic Assistants		1,295	1,312	1,368	(96)	1,272
Other Support/Trainees	1,702	2,083	2,645	2,699	0	2,699
Total	24,931	25,400	26,516	26,967	209	27,176

OPERATIONS APPROPRIATION

Operation of Traffic Control System	End of Year Employment - Controller Work Force (CWF)					
	FY 1987	FY 1988	FY 1989	(Est.) FY 1990	Proposed Change	(Est.) FY 1991
CENTERS - FPL and Other Controllers	5,150	5,683	5,726	5,783	293	6,076
- First Line Supervisors		739	788	796	33	829
Total Operational Controllers	5,150	6,422	6,514	6,579	326	6,905
- Developmental Pipeline	1,860	1,023	1,112	1,123	10	1,133
- Air Traffic Assts (ATA)	775					
Total Centers CWF	7,785	7,445	7,626	7,702	336	8,038
TOWERS - FPL and Other Controllers	6,212	6,769	7,134	7,205	79	7,284
- First Line Supervisors		1,260	1,368	1,382	34	1,416
Total Operational Controllers	6,212	8,029	8,502	8,587	113	8,700
- Developmental Pipeline	762	962	704	711	46	757
- Air Traffic Assts (ATA)	674					
Total Towers CWF	7,648	8,991	9,206	9,298	159	9,457
TOTAL - FPL and Other Controllers	11,362	12,452	12,860	12,988	372	13,360
- First Line Supervisors		1,999	2,156	2,178	67	2,245
Total Operational Controllers	11,362	14,451	15,016	15,166	439	15,605
- Developmental Pipeline	2,622	1,985	1,816	1,834	56	1,890
- Air Traffic Assts (ATA)	1,449					
TOTAL Controller Work Force	15,433	16,436	16,832	17,000	495	17,495

The table above reflects the redefinition of CWF beginning October 1, 1987 (FY 1988). Specifically, the new definition of CWF includes first-line supervisors and traffic management coordinators and excludes air traffic assistants and FAA Academy trainees.

OPERATIONS APPROPRIATION

Operation of Traffic Control System

Definitions of Centers and Towers Staffing:

FULL PERFORMANCE LEVEL CONTROLLER: A full performance level (FPL) controller is comprised of two groups: a series GS-2152 air traffic controller who has reached the highest nonsupervisory controller grade for the facility at which he/she is assigned, and is certified on all required positions in his/her area of specialization; and a traffic management coordinator who is responsible for administering traffic management programs including en route metering, ground delays, en route spacing and severe weather advisory programs.

OTHER OPERATIONAL CONTROLLER: Includes a controller at the FPL grade but not yet fully certified on all positions in their current facility, and a developmental controller who is certified on two or more positions of operation. An operational developmental controller will be grade GS-10 or above.

DEVELOPMENTAL PIPELINE: These are individuals who have completed FAA Academy training successfully and are assigned to air traffic control facilities but are not yet certified on at least two positions.

AREA SUPERVISOR: A full performance level controller is responsible for the safe and efficient operation of the area he/she supervises. Area supervisors maintain currency on all sectors within his/her area and are required to work a minimum of 10 percent of his/her time controlling traffic. Area supervisors in centers and towers are counted as CWF.

SPECIALIST: Specialist staffing includes air traffic training specialists, education, quality assurance, airspace and procedures, military operations, plans and programs specialists, and programmers.

OTHER SUPPORT/TRAINEES: Other support personnel include computer programmers, administrative and clerical support, and trainees at the FAA Academy. For example: Common Screen trainees include those controller candidates who have entered into the Academy for initial training, but have not yet been assigned to an option (terminal or en route) or facility. Radar Training Facility - The prerequisite for centers is completion of certification requirements on two manual positions. The prerequisite for towers is successful completion of Phase IX with the exception for personnel assigned to radar ONLY facilities after successful completion of Phase IV, non-radar air traffic control. The objective of this training is to prepare the developmental to operate the radar control position and to solve 23 radar demonstration control problems.

AIR TRAFFIC ASSISTANTS: Personnel who perform duties that were performed by controller trainees, developmentals, and full-performance-level controllers. Their duties support the functions of the controllers and relieve the controllers so they can devote their time to performing control duties. Phase out of ATA category began in FY 1990.

OPERATIONS APPROPRIATION

Operation of Traffic Control System

FAA Academy Trainees and Washout Rates

- FAA plans to hire approximately 2,082 controller trainees during FY 1990 to reach a minimum CWF goal of 17,000. To attain the FY 1991 goal of 17,495 controllers, approximately 2,400 controller trainees will be hired. This will replace controllers lost to training washouts, retirements, and other attrition, such as promotions to supervisory and management positions, to meet budgeted staffing levels.

- For the last several years FAA has been experiencing an approximate 40 percent loss rate at the Academy. FAA is working to reduce these loss rates through improved screening and selection. In FY 1988, for example, FAA implemented a project jointly with OPM to dramatically reduce the length of time between the controller screening exam and when a selectee receives his or her appointment to the FAA Academy. In FY 1989 and 1990, FAA began a program to overhaul and modernize the air traffic training system. Specific innovations and improvements planned include more simulation and automation to provide more effective training and to shorten training time, increased development of computer based instruction courses, major improvements in instructional design techniques, and a much stronger evaluation of training.

- FAA expects about 1,250 Academy graduates in FY 1990. Of these, 500 will be assigned to terminals and 750 to centers.

- For the Academy graduates currently in field training (who are prior year Academy graduates), FAA expects an approximate 15 percent loss rate in the terminal option and an approximate 35 percent loss rate in the en route option.

OPERATIONS APPROPRIATION

Operation of Traffic Control System

General Justification

Air Traffic Retirements 1/	CY 1988		CY 1989		CY 1990		CY 1991	
	Eligible	Actual	Eligible	Actual	Eligible	Estimate	Eligible	Estimate
Centers	587	210	681	198	858	249	980	285
Towers	807	236	895	264	1,060	313	1,199	354
TOTAL 2/	1,394	446	1,576	462	1,918	562	2,179	639

1. Numbers include air traffic controllers in Centers and Towers only.

2. Numbers exclude disability retirements.

OPERATIONS APPROPRIATION

Operation of Traffic Control System

The estimate for FY 1991 provides a net change of $140,373,000; -142 positions, and +546 FTE's over FY 1990. Changes in the requirements for FY 1991 follow:

	($000) TOTAL	CENTERS	TOWERS	STATIONS	PD&E
Annualization of FY 1990 WIG's....................	6,483	2,479	2,972	765	267
Annualization of FY 1990 Gr-to-Gr Promotions......	26,739	11,123	9,399	5,712	505
Annualization of FY 1990 Position Changes.........	10,000	4,682	4,021	776	521
New FY 1991 WIG's.................................	10,928	5,036	4,372	1,144	376
New FY 1991 Gr-to-Gr Promotions...................	37,720	18,168	16,036	2,698	818
Merit Pay...	3,627	1,453	1,656	165	353
Inflation...	6,184	424	714	393	4,653
Anticipated Retirements...........................	(12,984)	(2,678)	(3,064)	(2,071)	(5,171)
Computation of Extra Day..........................	5,635	2,248	2,307	696	384
FY 1990 Pay Raise Annualization...................	12,505	4,988	5,192	1,558	767
FY 1991 Pay Raise for GS and SES..................	22,018	8,783	9,142	2,743	1,350
Aeronautical Charting.............................	1,427	0	0	0	1,427
Reduction in Overtime.............................	(800)	(352)	(350)	(88)	(10)
Continuing Nondiscretionary NAS Plan Costs:					
Contract Weather Observations.................	3,809	0	0	0	3,809
Host Computer Commercial Software Licensing...	288	0	0	0	288
Subtotal, Price Level, Annualization and Other Nondiscretionary Changes....	133,579	56,354	52,397	14,491	10,337

OPERATIONS APPROPRIATION

Operation of Traffic Control System

	($000) TOTAL	CENTERS	TOWERS	STATIONS	PD&E
Reduction in Flight Service Station Positions	(7,000)	0	0	(7,000)	0
Air Traffic Assistant Phase-Out	(1,350)	(1,350)	0	0	0
Subtotal, Program Decreases	(8,350)	(1,350)	0	(7,000)	0
New Employment	10,144	4,343	5,801	0	0
Increased PCS Moves	5,000	1,272	2,080	773	875
Subtotal, Program Increases	15,144	5,615	7,881	773	875
TOTAL NET INCREASE	140,373	60,619	60,278	8,264	11,212

OPERATIONS APPROPRIATION

Operation of Traffic Control System

Price Level, Annualization, and Other Nondiscretionary Changes.................... 250 FTE's, $133,579,000

1. $33,222,000 will fund annualization of 8,324 within-grade increases ($6,483,000) and 6,798 grade-to-grade promotions ($26,739,000) approved in FY 1990 but effective for only a portion of the fiscal year.

2. $10,000,000 is required to fund 250 FTE's based on part-year employment for positions approved in FY 1990.

3. $48,648,000 is required for part-year funding of 13,927 within-grade increases ($10,928,000) and 8,678 grade-to-grade promotions ($37,720,000) for employees who will become eligible during FY 1991.

4. $3,627,000 will fund 3,360 merit pay increases in FY 1991.

5. $6,184,000 is due to inflationary and price level increases for travel, transportation of things, supplies and materials, printing and reproduction, and other services.

6. A reduction of $12,984,000 is proposed for anticipated retirements which represent an estimated 2.4 percent of the controller work force and 3.6 percent for the other than controller work force and are projected to be replaced with employees at lower grade levels.

7. $5,635,000 is an FY 1991 adjustment for the "Extra Day". The FAA Personnel, Compensation and Benefits model computes compensation for the 260 day "average" work year. FY 1991 contains 261 compensable work days.

8. $12,505,000 is requested to cover one quarter of the annualized cost of the FY 1990 3.6 percent pay raise.

9. $22,018,000 is requested to cover one-half of the three-quarter year costs of the FY 1991 3.5 percent pay raise and the Senior Executive Service pay raise. The remaining 50 percent of the cost in FY 1991 is covered by prudent management of other resources. This will entail more effective position controls such as delays in hiring and backfilling vacancies at lower grades, primarily within the non-safety related areas, and through more efficient management of travel and support contracts.

OPERATIONS APPROPRIATION

Operation of Traffic Control System

10. $1,427,000 is required for Aeronautical Charting Program to pay for a nondiscretionary increase in the FAA's portion of Chart Compilation and data base maintenance. The Aeronautical Charting Program is a continuous and essential activity that supports operational requirements throughout the FAA. This program implements all changes to the NAS via the publication of updated aeronautical charts and related publications. In addition, the program provides various critical products and services to the FAA field functions including air traffic control, flight inspection, and procedure development.

    The program is characterized by continuous growth and constantly changing priorities. Because of this growth and the increasing sophistication of the NAS, new charting products are constantly being produced. These new products support new navigation systems and other FAA programs. Once introduced, these charting products require updating. The maintenance charge is FAA's portion of the National Oceanic and Atmospheric Administration (NOAA) cost for compilation and data base management. This is necessary for NOAA to update public use aeronautical charts every 56 days. This represents a 12 percent increase over an existing base of $11,703,000.

11. Overtime is expected to decrease by 28,000 hours and effect a savings of $800,000. Increased staffing, use of reemployed annuitants and contractual support for training account for much of this decrease.

12. The FAA is currently midway through implementation of a major effort to modernize the National Airspace System (NAS). Capital expenditures for modernization of the NAS are made under the Facilities and Equipment Appropriation. Once new systems are put in place, the costs of operating and maintaining the systems are covered by the Operations Appropriation. This is in addition to operating and maintenance costs associated with existing systems which have not yet been replaced or phased out. Follow-on costs associated with the implementation of new NAS related systems are nondiscretionary in nature. FAA must cover these costs as new systems are brought on line.

    - $3,809,000 is the additional amount needed to provide contract weather observation service at 34 Flight Service Stations that are scheduled for consolidation in FY 1990. The FAA is required by P.L. 97-248 to maintain weather observation service when a Flight Service Station providing that service is consolidated. The FAA will add to these contracts the provision for airport information services and navigational aids monitoring to facilitate consolidation at these 34 locations. The National Weather Service supports FAA in this program. This represents an increase of 26.9 percent over a base of $14,174,500.

OPERATIONS APPROPRIATION

Operation of Traffic Control System

- o $288,000 is necessary for the Host Computer Software License which the system utilizes to operate. This commercial software is comprised of approximately 27 products which are owned by a private vendor. Currently, the cost associated with this software is an annual recurring cost and subject to a yearly renewal of a License and Lease agreement. The increase will allow the government to upgrade to the next released version of this software package, and is an 18.0 percent increase over an existing base of $1,600,000.

Recommended Program Decreases.. -300 positions, -200 FTE's, -$8,350,000

1. A decrease of 200 positions, 150 FTE's and $7,000,000 is requested due to the continuation of closing/consolidating flight service stations as automated flight service stations are commissioned and contractual services expanded.

2. A savings of 100 positions, 50 FTE's, and $1,350,000 is due to the phasing out of Air Traffic Assistants which began in FY 1990.

Recommended Program Increases.. 158 positions, 496 FTE's, $15,144,000

1. The increase of 158 positions represents planning positions. There are no additional FTE or dollar increases as these will be financed within the existing program as resources permit.

2. Controller work force (CWF) staffing requires an increase of $10,144,000 and 496 FTE's to bring the CWF level to 17,495 by September 30, 1991.

   The FAA uses several factors in determining the number of controllers to include in its budget. These factors include, but are not limited to, staffing standards employing forecasts of aviation activity, the number of controllers in training and not available during the budget year for air traffic control, and an estimate of the number of additional sectors and control positions that may be required once operational details are developed in the budget year (e.g., TCA's, ARSA's).

OPERATIONS APPROPRIATION

Operation of Traffic Control System

While the airlines and the FAA cannot predict 18 to 24 months in advance when new routes or hubs may be established and what impact this may have on controller work force staffing requirements at specific locations, the general trends provide an indication of the aggregate resource requirements. Still to be determined are the productivity improvements that will be realized once the National Airspace System Plan improvements are completely implemented. While goals have been established, the actual improvements will depend on the extent and timing of changes in airspace and procedures.

3. $5,000,000 is needed for approximately 160 additional change of station moves in FY 1991. PCS moves are generated by promotions and transfers of controllers to higher level facilities. The flexibility to move controllers to higher level facilities or facilities experiencing staffing shortages has been severely restricted the last few years because of funding constraints, the absorption of unbudgeted mandatory pay costs, and the rising costs of relocation services. For example, in FY 1988 we made 1,679 PCS moves at a cost of $36,204,300; average cost per move $21,600. In FY 1989, due to inflation and an increase in relocation services, PCS moves decreased to 1,405 at a cost of $35,675,000; average cost per move $25,400. In FY 1990, we estimate 1,400 PCS moves for approximately $40,000,000, at approximately $28,600 each. The $5,000,000 FY 1991 increase provides for a total of $45,000,000 which will fund approximately 1,350 moves at an estimated cost of $33,300 each.

The lack of PCS funds has caused the agency to defer moving controllers who have been successful in lower level facilities to higher level, more complex, air traffic facilities. These deferred PCS moves, some for as long as 18 to 24 months, have denied the agency the ability to assign the best qualified personnel to our busiest facilities in the most reasonable amount of time. Only through PCS funds can we redistribute the current controller work force to correct the staffing imbalances that exist.

The success rate for attaining FPL status for those progressing through the various terminal levels is approximately 83 percent. Progression is augmented in some facilities by placing direct hires from the Academy. All centers are at the same level, equivalent to the Level V terminals. Success rate to attain FPL status for Academy graduates placed directly in the centers is approximately 60 percent. Placing Academy graduates directly in higher level facilities creates morale problems at the lower level facilities because these controllers can attain FPL status more quickly than those who must move through the system. Our union agreement assures new controllers that opportunities for FPL status will be provided equitably to all. Lack of sufficient PCS funds has caused the agency to defer moving the GS-11 and GS-12 journeyman controllers at the lower level facilities to the higher facilities where the journeyman level is GS-13 or GS-14.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS APPROPRIATION
NAS System Logistics Support

	Dollar Resources ($000)			Staffing			
					Ceiling FTE		
	PC&B	Other Objects	Total	FTP Pos.	Total	FTP	OTFTP
1. FY 1989 Actual	$59,313	$133,577	$192,890	1,481	1,571	1,515	56
2. FY 1990 Program Level	63,354	142,950	206,304	1,525	1,595	1,540	55
3. Price Level, Annualization and other non-discretionary changes	2,620	13,108	15,728	54	4	4	0
4. Program Reductions (Discretionary)	0	(4,870)	(4,870)	0	0	0	0
5. Recommended Program Increases	0	0	0	0	0	0	0
6. FY 1991 Request Level	$65,974	$151,188	$217,162	1,579	1,599	1,544	55

OPERATIONS APPROPRIATION

NAS Logistics Support

General Justification

For FY 1991 the NAS Logistics Support Activity will require $217,162,000, 1,579 Positions, and 1,599 FTE's. This represents a net increase of $10,858,000 over the FY 1990 level.

The agency has embarked on a program of modernization that uses cradle to grave, life cycle acquisition processes. This is a structured process that allows for the acquisition, maintenance and operation of National Airspace System (NAS) equipment in an efficient and economical manner. The first two steps of the life cycle are approximately 30 percent of the required life cycle expenditure and are funded through the Facilities and Equipment (F&E) appropriation. The remaining 70 percent is funded within the Operations appropriation. This budget identifies the logistics portion of the maintenance and operations necessary to complete a year of the life cycle.

This activity includes: agency-wide procurement for major air traffic control and air navigation systems; purchasing, leasing, and management of real estate including land, office space, and specialized facilities; material management, property management and administrative services to support the day-to-day operations of the agency; depot and limited field level maintenance and supply support for NAS equipment and agency aircraft; replenishment and repair of spares.

The NAS Logistics Support program consists of four subactivities:

Maintenance of Spares and Repair Parts

This subactivity represents 46 percent of the total program and 12 percent of the FY 1991 non-discretionary increase. Included are personnel, material, and support equipment for high value and unique repairable modules used to replace failed operational equipment components, and to support the daily operations of the agency. These functions are essential for continued performance of previously installed field equipment and new NAS systems. The maintenance required calls for specialized training and sophisticated testing procedures to perform detailed repair of complex multi-level printed circuit boards, major structural repair of navigation and landing systems previously installed in the field; maintenance of training facilities at the FAA Academy, and engineering support for depot level maintenance. Resources to support the FAA Depot, a critical function within FAA, are included in this subactivity also. The FAA Depot operates 24 hours a day, 365 days a year and is responsible for the

OPERATIONS APPROPRIATION

NAS Logistics Support

Maintenance of Spares and Repair Parts (Cont.)

management of FAA's central materiel inventory and distribution system. It provides logistics support to 14,200 facilities, 55 aircraft, 72 foreign countries, 2,500 ordering offices and other government agencies. Further, this subactivity supports FAA's aircraft used in Flight Standards for inspector currency, enforcement, and flight inspection of air navigational facilities; the research and development (R&D) programs at the FAA Technical Center; and provides material and property management to support the day-to-day operation of the Agency. The activity includes the maintenance and operational support of the Logistics and Inventory System (LIS) --the automated system which performs the logistics portion of the Integrated Logistics System (ILS), a function which is an integral part of the NAS modernization program.

The funding for this subactivity provides for maintenance of NAS equipment. It also provides for the acquisition of repair parts and serviceable spares and allows FAA to respond to the growing needs of the flying public.

Procurement and Acquisition

This subactivity represents 10 percent of the total program and 12 percent of the FY 1991 non-discretionary increase. Included are resources for the agency's procurement processes including acquisition and contract administration for: scheduled implementation of the major NAS plan systems; real estate; spares; repair parts and material to maintain operational air navigation, air traffic control facilities and Agency aircraft; maintenance of FAA Academy training equipment; and FAA owned and leased property.

Structural and Specialized Tasks

This subactivity represents 42 percent of the total program and 75 percent of the FY 1991 non-discretionary increase (GSA Rent and rent inflation 47 percent, utilities 9 percent, and all other 19 percent). Included are resources to operate and maintain the Mike Monroney Aeronautical Center and the FAA Technical Center, including the Atlantic City International Airport. This includes the alteration, maintenance, and repair of buildings, grounds and roads; management of administrative property; technical administration of contracted A-76 activities; and management of FAA owned and leased housing to support

OPERATIONS APPROPRIATION

NAS Logistics Support

Structural and Specialized Tasks (Cont.)

Air Traffic and Airway Facilities personnel at remote locations. It also includes funding for GSA rent to house the Headquarters, regional offices and many field facilities, including rent for the Center for Management Development, Washington and regional headquarters motor fleet, facility security and fire protection; repair and maintenance necessary to prevent structural damage; and administrative services to support the day-to-day operations of the FAA.

The funding requested for this subactivity will provide safe and structurally sound, secure buildings for persons and property; prevent higher cost emergency repairs for items that were not repaired while the problem was minimal; have functional space available to support increased activity related to required operations. In addition, the FAA will be able to efficiently operate large installations which support the agency's aircraft, depot level maintenance of NAS equipment, agency's training facilities, medical programs, airmen and aircraft records, research, engineering and development programs and aircraft and airports safety programs.

Planning, Direction and Evaluation

This subactivity represents 2 percent of the total program and 1 percent of the FY 1991 non-discretionary increase. Included are resources to plan, direct and define program objectives, formulate standards and procedures, and evaluate the effectiveness of the total logistics operation. Included are logistics personnel in the Logistics Service, regional headquarters, Mike Monroney Aeronautical Center, and the FAA Technical Center who supervise and evaluate the day to day operation of field facilities, develop and approve operation plans and procedures, and assure the compliance with Federal Acquisition Regulations.

OPERATIONS APPROPRIATION

Workload Measures

Category	Number of Items 1988 (Actual)	1989 (Actual)	1990 (Est.)	1991 (Est.)	--Percent Change-- 1988 1989	1989 1990	1990 1991
Procurement Requests Processed	67,174	74,303	78,904	84,792	10.61%	6.19%	7.46%
Contracts Awarded	6,522	7,937	9,595	11,348	21.70%	20.89%	18.27%
Contracts Under Administration	7,043	9,188	10,622	12,069	30.46%	15.61%	13.62%
Real Property Contracts Being Administered	15,120	16,854	17,468	18,397	11.47%	3.64%	5.32%
Number of Space Acquisitions	701	892	988	1,033	27.25%	10.76%	4.55%
Number of Land Acquisitions	1,630	1,987	2,109	2,159	21.90%	6.14%	2.37%
Number of Land and Space Utilization Surveys	37	85	88	98	129.73%	3.53%	11.36%
Number of Real Property Disposal Actions	419	465	508	517	10.98%	9.25%	1.77%
Number of Utility Contracts	5,489	5,471	5,716	6,115	-0.33%	4.48%	6.98%
Excess Property Actions (Line Items)	26,931	27,604	28,123	28,894	2.50%	1.88%	2.74%
In-Use Property Inputs	125,221	140,560	137,785	139,725	12.25%	-1.97%	1.41%
Survey Reports for Lost/ Damaged Property	477	729	528	648	52.83%	-27.57%	22.73%

OPERATIONS APPROPRIATION

NAS Logistics Support

Resource Summary ($000)

		(Actual) FY 1987	(Actual) FY 1988	(Actual) FY 1989	(Est.) FY 1990	Change	(Est.) FY 1991
Maintenance of Spares and Repair Parts...	PC&B	$25,694	$26,384	$28,945	$29,787	$917	$30,704
	O.O.	53,665	50,825	57,228	69,523	415	69,938
	Total	79,359	77,209	86,173	99,310	1,332	100,642
Procurement and Acquisition.............	PC&B	9,028	13,221	17,141	19,173	1,284	20,457
	O.O.	503	3,552	685	652	5	657
	Total	9,531	16,773	17,826	19,825	1,289	21,114
Structural and Specialized Tasks.........	PC&B	11,130	11,331	10,321	11,116	314	11,430
	O.O.	72,543	82,815	74,165	71,705	7,813	79,518
	Total	83,673	94,146	84,486	82,821	8,127	90,948
Planning, Direction and Evaluation.......	PC&B	3,914	3,253	2,906	3,278	105	3,383
	O.O.	624	2,021	1,499	1,070	5	1,075
	Total	4,538	5,274	4,405	4,348	110	4,458
TOTAL -	PC&B	49,766	54,189	59,313	63,354	2,620	65,974
	O.O.	127,335	139,213	133,577	142,950	8,238	151,188
	Total	177,101	193,402	192,890	206,304	10,858	217,162

OPERATIONS APPROPRIATION

NAS Logistics Support

Staffing Information

FTP Positions	(Actual) FY 1987	(Actual) FY 1988	(Actual) FY 1989	(Est.) FY 1990	Proposed Change	(Est.) FY 1991
Maintenance of Spares and Repair Parts....	744	735	711	810	37	847
Procurement and Acquisition..............	392	379	385	390	10	400
Structural and Specialized Tasks..........	277	254	311	258	6	264
Planning, Direction and Evaluation........	78	72	74	67	1	68
TOTAL..............................	1,491	1,440	1,481	1,525	54	1,579

Ceiling FTE's	(Actual) FY 1987	(Actual) FY 1988	(Actual) FY 1989	(Est.) FY 1990	Proposed Change	(Est.) FY 1991
Maintenance of Spares and Repair Parts....	709	722	800	829	4	833
Procurement and Acquisition..............	372	380	442	420	0	420
Structural and Specialized Tasks..........	257	273	214	274	0	274
Planning, Direction and Evaluation........	78	74	115	72	0	72
TOTAL..............................	1,416	1,449	1,571	1,595	4	1,599

End of Year Employment Information	(Actual) FY 1987	(Actual) FY 1988	(Actual) FY 1989	(Est.) FY 1990	Proposed Change	(Est.) FY 1991
Maintenance of Spares and Repair Parts....	769	698	739	821	35	856
Procurement and Acquisition..............	391	360	407	403	9	412
Structural and Specialized Tasks..........	256	242	286	263	5	268
Planning, Direction and Evaluation........	71	68	75	62	1	63
TOTAL..............................	1,487	1,368	1,507	1,549	50	1,599

OPERATIONS APPROPRIATION

NAS Logistics Support

The estimate for 1991 provides a net change of $10,858,000, 54 positions and 4 FTE's. Changes in requirements for FY 1991 are as follows:

	($000)
Annualization of FY 1990 WIGS	376
New FY 1991 WIGS	514
Merit Pay	355
Annualization of FY 1990 FTE increase	200
Inflation	4,262
Anticipated Retirements	(504)
FY 1990 pay raise annualization	548
FY 1991 pay raise/Senior Executive Service pay raise	861
One extra work day	270
GSA Space rent	6,487
GSA Space rent inflation	908
Utilities	1,451
Total nondiscretionary	15,728
Equipment reduction	(608)
Other Services reduction	(4,262)
Total program decreases	(4,870)
Total Net Increase	10,858

OPERATIONS APPROPRIATION

NAS Logistics Support

Price Level, Annualization and Other Nondiscretionary Changes......54 positions and 4 FTE, $15,728,000

1. $376,000 will fund annualization of 661 within-grade increases in FY 1990 that are effective for only a portion of the fiscal year.

2. $514,000 is required for part-year funding of 883 within-grade increases for employees who will become eligible during FY 1991.

3. $355,000 will fund 173 merit pay increases in FY 1991.

4. $200,000 and 4 available FTE's are required to annualize positions approved in FY 1990. A restoration of 54 positions to the base is a technical adjustment which aligns positions to reflect actual program requirements.

5. $4,262,000 is due to inflationary and price level increases for travel, transportation of things, equipment, supplies and materials and other services.

6. A reduction of $504,000 is proposed for anticipated retirements which are projected to be replaced with employees at lower grade levels.

7. $548,000 is requested to cover one quarter of the annualized cost of the FY 1990 3.6 percent pay raise.

8. $861,000 is requested to cover one-half of the three-quarter year costs of the FY 1991 3.5 percent pay raise and the Senior Executive Service pay raise. The remaining 50 percent of the cost in FY 1991 is covered by prudent management of other resources. This will entail more effective position controls such as delays in hiring and backfilling vacancies at lower grades, primarily within the non-safety related areas, and through more efficient management of travel and support contracts.

9. $270,000 is an FY 1991 adjustment for an additional compensable workday. FY 1991 contains 261 compensable work days.

OPERATIONS APPROPRIATION

NAS Logistics Support

Price Level, Annualization and Other Nondiscretionary Changes (Con't)

10. $6,487,000 is required for rental of GSA space. This represents the amount of FY 1991 increases over and above the allowed inflation rate. Rental payments to GSA in FY 1991 are estimated at $45,406,000.

11. $908,000 is due to inflation on GSA space rent.

12. $1,451,000 is due to utility rates above inflation and additional electricity consumption.

Recommended Program Decreases..-$4,870,000

1. A reduction of $608,000 due to one-time equipment purchases in FY 1990.

2. A savings due to one-time costs incurred in FY 1990 will reduce the base in FY 1991 by $4,262,000.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS APPROPRIATION
Maintenance of Traffic Control System

	Dollar Resources ($000)			Staffing			
					Ceiling FTE		
	PC&B	Other Objects	Total	FTP Pos.	Total	FTP	OTFTP
1. FY 1989 Actual	$490,063	$170,043	$660,106	10,454	9,863	9,739	124
2. FY 1990 Program Level	526,503	187,197	713,700	10,445	10,110	9,983	127
3. Price Level, Annualization and other non-discretionary changes	30,923	7,491	38,414	0	315	315	0
4. Program Reductions (Discretionary)	0	(4,112)	(4,112)	0	0	0	0
5. Recommended Program Increases	3,170	0	3,170	291	100	100	0
6. FY 1991 Request Level	$560,596	$190,576	$751,172	10,736	10,525	10,398	127

OPERATIONS APPROPRIATION

Maintenance of Traffic Control System

General Justification

For FY 1991, the operation of the Systems Maintenance activity will require $751,172,000, 10,736 FTP positions, and 10,525 FTE's. This represents a net increase of $37,472,000, 291 FTP positions, and 415 FTE's over the FY 1990 level.

The Maintenance of the Traffic Control System consists of three major subactivities:

Field Maintenance

This subactivity contains resources for the maintenance and repair of facilities and equipment comprising the National Airspace System. These functions include maintenance of air traffic control equipment, navigation and landing aids, flight service facilities, and support of FAA plant facilities.

Engineering

These employees are responsible for developing, coordinating, and prescribing technical standards and procedures for installation improvement, performance, and maintenance of facilities in the National Airspace System (NAS). Personnel financed under this subactivity are located in Washington, the regional headquarters, the Mike Monroney Aeronautical Center, and the Federal Aviation Administration Technical Center.

Planning, Direction and Evaluation

Personnel funded under this subactivity are responsible for planning and directing, defining program objectives, formulating standards, and evaluating the effectiveness of operations related to the design, installation, improvement, and maintenance of facilities in the National Airspace System. These employees are located in Washington, the Regional Headquarters, the Mike Monroney Aeronautical Center, and the Federal Aviation Administration Technical Center.

OPERATIONS APPROPRIATION

Maintenance of Traffic Control System

Major Initiatives and Changes

The field maintenance workload will require an increase of 260 FTP positions, 100 FTE's and $3,170,000 to bring AF sector employment up to a level that will support NAS maintenance workload in FY 1991 and beyond. In addition, 31 FTP positions will be needed to accommodate increased Telecommunications Management and Operations (TM&O) workload and NAS Plan requirements.

OPERATIONS APPROPRIATION

Maintenance of Traffic Control System

Workload and Performance Indicators

The following performance indicators have been developed for the field maintenance subactivity:

Fiscal Year	Number of Facilities	Equipment and Service Availability
1987	22,661	99.75%
1988	23,253	99.77%
1989	24,832	99.76%
1990	24,963 (est.)	99.77% (est.)
1991	25,560 (est.)	99.77% (est.)

The estimate for FY 1991 provides for the continuation of direct maintenance services, including direction and engineering, related to the operation and improvement of the technical operation and maintenance of facilities and equipment essential to the safety and reliability of the National Airspace System (NAS).

The additional funds are required to provide for the increased costs of maintaining the existing facility systems in operation at the end of FY 1990 and the maintenance for new facilities and equipment approved in prior years Facilities and Equipment appropriations that are either under construction or scheduled for commissioning and operation in FY 1991.

SUMMARY OF MAJOR ESTABLISHMENTS AND REPLACEMENTS

ESTABLISHMENT PROGRAM	FY 1988 BASE	FISCAL YEAR 1989			FISCAL YEAR 1990			FISCAL YEAR 1991		
		COMMISS-IONINGS	DISCONT. SERVICE	END OF YEAR	COMMISS-IONINGS	DISCONT. SERVICE	END OF YEAR	COMMISS-IONINGS	DISCONT. SERVICE	END OF YEAR
EN ROUTE AIR TRAFFIC CONTROL SERVICES										
AIR ROUTE SURVEILLANCE RADAR	112	1		113	3		116	1		117
AIR ROUTE TRAFFIC CONTROL CENTER	21			21			21			21
ATC BEACON INTERROGATOR	20			20	2		22		-2	20
COMBINED CENTER/TERMINAL FACILITIES	3			3			3			3
TERMINAL AIR TRAFFIC CONTROL AND SERVICES										
AT SERVICES										
VFR TOWERS:										
FAA OPERATED	215	1	-5	211	6	-3	214		-15	199
FAA CONTRACT TOWER	17	4		21	7		28	17		45
NONRADAR APPROACH CONTROL TOWER	19			19		-3	16			16
LIMITED RADAR APPROACH CONTROL TOWER	28	5		33			33			33
FULL RADAR APPROACH CTL TWR(ATCT/TRACONS & TRACABS)	150		-2	148	2	-1	149	1		150
TERMINAL RADAR APPROACH CONTROL (TRACON ONLY)	24	3		27	1		28			28
AF FACILITIES										
AIRPORT SURFACE DETECTION EQUIPMENT	13			13	6		19	5		24
AIRPORT SURVEILLANCE RADAR	202		-2	200	6		206	5		211
ATC RADAR BEACON	313			313	6	-1	318	5	-6	317
AUTOMATED RADAR TERMINAL SYSTEM	152	12		164	9		173	4		177
RADIO COMMUNICATIONS LINK REPEATER	170	133		303	265		568	122		690
RADIO COMMUNICATIONS LINK TERMINAL	98	39		137	44		181	14		195
TERMINAL DOPPLER WEATHER RADAR	0			0	2		2	1		3

SUMMARY OF MAJOR ESTABLISHMENTS AND REPLACEMENTS

ESTABLISHMENT PROGRAM	FY 1988 BASE	FISCAL YEAR 1989			FISCAL YEAR 1990			FISCAL YEAR 1991		
		COMMISS-IONINGS	DISCONT. SERVICE	END OF YEAR	COMMISS-IONINGS	DISCONT. SERVICE	END OF YEAR	COMMISS-IONINGS	DISCONT. SERVICE	END OF YEAR
FLIGHT SERVICE FACILITIES										
FLIGHT SERVICE STATIONS:										
DOMESTIC	182		-22	160		-36	124		-39	85
INTERNATIONAL	1			1			1			1
AUTOMATED	45	1		46	11		57	2		59
FLIGHT SERVICE DATA PROCESSING SYSTEM	13			13			13			13
AUTOMATED WEATHER OBSERVING SYSTEM	8	3		11	138		149	49		198
NEXT GENERATION WEATHER RADAR	0			0	6		6	18		24
DIRECTION FINDER EQUIPMENT	255		-9	246	36		282	48		330
INTERNATIONAL AERONAUTICAL TELECOMMUNICATIONS SWITCHING CENTER	1			1			1			1
REMOTE CENTER AIR/GROUND COMMUNICATIONS FACILITY	635	7		642	6		648	12		660
REMOTE COMMUNICATIONS OUTLET	1667	13		1680	40	-3	1717	14		1731
NAVIGATION AND LANDING AIDS										
APPROACH LIGHT SYSTEM	780	421		1201	47	-12	1236	19	-6	1249
DISTANCE MEASURING EQUIPMENT	430	22		452	13		465	8		473
INSTRUMENT LANDING SYSTEM	881	6		887	19		906	10		916
LEAD-IN LIGHT FACILITY	18			18			18			18
MICROWAVE LANDING SYSTEM	2	1		3	25		28	91		119
OMNIDIRECTIONAL AIRPORT LIGHTING SYSTEM	37			37	4		41	4		45
RUNWAY END IDENTIFICATION LIGHT	576	20		596	56		652	14		666
RUNWAY VISUAL RANGE	444	3		447	55		502	42		544
TACTICAL AIR NAVIGATION EQUIPMENT	667		-6	661	2		663	3		666
VHF OMNIDIRECTIONAL RANGE	945		-2	943	2		945	8		953
VISUAL APPROACH SLOPE INDICATOR	1340	4		1344	28	-1	1371	2		1373

REPLACEMENT PROGRAM	FY 1989	FY 1990	FY 1991
AIRPORT SURVEILLANCE RADAR	1	3	114
VOR/VORTAC	28	3	20
INSTRUMENT LANDING SYSTEM	6	4	38
ARTS	40	6	27

NOTE. Commissionings include upgrade of existing facilities as well as new facilities.

OPERATIONS APPROPRIATION

Maintenance of Traffic Control System

New facilities and services are necessary for the following systems:

En Route Air Traffic Control and Services: Facilities in this system promote the safe, expeditious, and orderly flow of aircraft operating on Instrument Flight Rules (IFR) flight plans within controlled airspace, primarily between departure and destination terminal areas. In FY 1991, one new air route surveillance radar facility is planned for commissioning.

Terminal Control and Services: Facilities in this system ensure the safe and efficient flow of aircraft operating in the immediate vicinity of the airport and provide for approach control services to ensure separation of arriving, departing and en route aircraft. In FY 1991, 156 new facilities are planned for commissioning in this system: five airport surface detection equipment systems, five airport surveillance radars, five air traffic control radar beacons, four automated radar terminal systems, 122 radio communications link repeaters, 14 radio communications link terminals, and one terminal doppler weather radar.

Flight Service Facilities: The system includes facilities for flight assistance, en route/ground communications, dissemination of meteorological and aeronautical information, and monitoring of navigation aids. In FY 1991, 143 new facilities are planned for commissioning in this system: 2 automated flight service stations, 49 automated weather observing systems, 18 next generation weather radars, 48 direction finders, 12 remote center air/ground communications facilities, and 14 remote communication outlets.

Navigation and Landing Aids: Navigation facilities in this system define the location of principal airways and enable pilots to determine positive distance and direction information from ground stations. The landing aids provide pilots with direction, distance, vertical guidance, and alignment during approach and landing in Instrument Flight Rules conditions. In addition, there are a variety of lighting aids which enable pilots to have visual contact with the active runway through visual aids to align the aircraft to the approach path and runway. In FY 1991, 201 such facilities are scheduled for commissioning.

OPERATIONS APPROPRIATION

Maintenance of Traffic Control System, Activity Summary ·

Major New Facilities Scheduled for Commissioning in 1991

1. En Route Air Traffic Control Services
    a. Air Route Surveillance Radar (1 location)
        (1) Texas: Rocksprings
2. Terminal Air Traffic Control and Services
    a. Airport Surface Detection Equipment (5 locations)
        (1) Colorado: Denver (2)
        (2) Florida: Tampa
        (3) New York: La Guardia
        (4) Tennessee: Memphis
    b. Airport Surveillance Radar (5 locations)
        (1) Florida: Daytona Beach
            Whiting
        (2) Kansas: Topeka
        (3) Missouri: Columbia
        (4) Oregon: Hillsboro
    c. Air Traffic Control Radar Beacon (5 locations)
        (1) Colorado: Denver
        (2) Florida: Pensacola
        (3) Oregon: Hillsboro
        (4) Texas: Dallas-Fort Worth
            Harlingen
    d. Automated Radar Terminal System (4 locations)
        (1) Montana: Billings
        (2) North Dakota: Fargo
        (3) Washington: Moses Lake
            Pasco

e. Radio Communications Link Repeater (122 locations)

(1) Arkansas: Arkadelphia
Forest City
Guernsey
Hazen
Ironton
Lonoke
Mandeville
Prescott
Social Hill
Tull
West Memphis
Wheatly

(2) Colorado: Brush
Haxtun
Julesburg
Keenesburg
Sterling
Wiggins

(3) Florida: Cogdell
Folkston
Ocilla
Thalman
Waverly
Waycross

(4) Georgia: Burroughs
Thalman
Willacoohee

(5) Iowa: Beaconsfield
Bryant
Fairfield
New Liberty
Washington

(6) Idaho: Conner
Blackfoot
Bliss
Bonanza
Glenns Ferry
Hamer
Jerome
Little Butte
Meridian
Mullan Pass
Orchard
Paul
Pocatello
Squaw Butte
Wardner Peak

(7) Illinois: Mazon

(8) Indiana: Cataract
Clayton
Bicknell
Evansville
Linton
Staunton
Winslow

(9) Michigan: Ann Arbor

(10) Minnesota: Goodhue
Wabasha

(11) Mississippi: Byhalia
Hernando

(12) Missouri: Braymer

(13) Montana: Billings
Bozeman (2)
Barter Ranch
Butte
Center Hill
Clover
Columbus
Coppertown
Drummond
Greer Gulch
Livingston
Miller Peak
Patricks Knob
Rocky Ridge
Virginia City

(14) Nevada: Carlin
Elko
Rocky Point
Wells
Wendover

(15) Ohio: Columbia Station (2)
Dalton
Lafayette
Montville
Paris
Salineville
Shaker Heights

(16) Pennsylvania: Pennline

(17) South Carolina: Givhans
Hardeeville
Jacksonboro
Yemasee

(18) Utah: Barro
Brigham
Delle
Ogden
Promontory
Snowville
Strevell

(19) Washington: Cle Elum
Grass Mountain
Kittitas
Marlin
Medical Lake
Mohler
Moses Lake
Riddle Hill
Spokane
Stampede Pass

(20) Wisconsin: Baraboo
Columbus
North Bend
Reedsburg
Swinns Valley
Tomah

(21) Wyoming: Basin
Riverton
Thermopolis
Workland

f. Radio Communications Link Terminal (14 locations)

(1) Alabama: Citronelle

(2) Idaho: Ashton
Cascade

(3) Louisiana: Slidell

(4) Mississippi: Byhalia

(5) South Carolina: Jedburg

(6) Tennessee: Memphis

(7) Utah: Salt Lake City (2)

(8) Washington: Mica Peak
Pasco (2)
Seattle

(9) Wyoming: Lovell

g. Terminal Doppler Weather Radar (1 location)

(1) Georgia: Atlanta

3. Flight Service Facilities

a. Automated Flight Service Station (2 locations)

(1) Idaho: Boise

(2) Montana: Great Falls

b. Automated Weather Observing System (49 locations)

(1) Alabama: Huntsville
    Muscle Shoals

(2) Alaska: Bethel
    Cordova
    Homer
    Juneau
    Kenai
    Northway
    Tanana
    Valdez

(3) California: Crescent City

(4) Florida: Ocala

(5) Kentucky: Bowling Green
    Henderson
    Paducah

(6) Michigan: Ironwood
    Kincross

(7) Minnesota: Bemidji
    Fairmont
    Grand Rapids
    Hibbing
    Mankato
    Marshall

(8) North Dakota: Devils Lake
    Dickinson

(9) New Jersey: Belmar-Farmi
    Robbinsville
    Toms River

(10) New Mexico: Las Vegas
    Tucumcari

(11) Ohio: Findlay

(12) Oregon: Corvallis
    North Bend
    Redmond

(13) South Dakota: Brookings
    Mitchell
    Thief River
    Yankton

(14) Tennessee: Jackson
    Memphis
    Nashville
    Smyrna

(15) Texas: Greenville

(16) Utah: Provo
    Wendover

(17) Virginia: Chesterfield
    Manassas

(18) Washington: La Grande

c. Next Generation Weather Radar (18 locations)

(1) Alabama: Birmingham

(2) Colorado: Denver

(3) Florida: Key West
Miami (2)
Orlando
Tampa (2)

(4) Georgia: Atlanta

(5) Illinois: Chicago

(6) Kentucky: Paducah

(7) North Carolina: Charlotte
Hatteras
Raleigh
Wilmington

(8) South Carolina: Charleston (2)

(9) Texas: Goodland

d. Direction Finder Equipment (48 locations)

(1) Alabama: Selma

(2) Alaska: Buckland
Indian Mountain
Point Hope

(3) Arizona: Nogales

(4) California: Alturus
Ukiah

(5) Colorado: Gunnison
Hayden
La Junta

(6) Florida: Avon Park

(7) Georgia: Valdosta

(8) Indiana: Fort Wayne

(9) Kentucky: Bowling Green

(10) Michigan: Litchfield
Muskegon

(11) North Carolina: Elizabeth City
Hickory
Rocky Mount

(12) North Dakota: Devils Lake
Fargo
Williston

(13) New Mexico: Corona
Taos

(14) Oregon: Sexton Summit

(15) Puerto Rico: Mayaguez

(16) South Carolina: Anderson
North Myrtle Beach

(17) Tennessee: Jacks Creek
  Knoxville
  Shelbyville

(18) Texas: Eagle Lake

(19) Utah: Salt Lake City
  Sunnyside

(20) Virginia: Gordonsville
  Lawrenceville
  Montebello

(21) Washington: Mullan Pass
  Omak
  Stampede Pass
  Yakima

(22) West Virginia: Elkins
  White Sulphur Springs

(23) Wyoming: Boysen Reservoir
  Cherokee
  Gillette
  Medicine Bow
  Riverton

e. Remote Center Air/Ground Communications Facility (12)

(1) Alabama: Hamilton

(2) Alaska: Cape Gull
  Gambell
  Kodiak
  Northway
  Sand Point
  Tanana
  Teller
  Umiat

(3) Montana: Missoula

(4) Texas: Rockport

(5) Wyoming: Rock Springs

f. Remote Communications Outlet (14 locations)

(1) Alaska: Kivalina
  Northway
  Platinum

(2) Florida: Gainesville

(3) Maine: Kennebunk

(4) Minnesota: Owatonna

(5) Mississippi: Columbus
  Tupelo

(6) Montana: Broadus

(7) New Mexico: Tucumcari

(8) Wyoming: Lusk
  Sundance

(9) Texas: Corpus Christi
  Geronimo

4. Navigation and Landing Aids

a. Approach Light System (19 locations)

(1) Arizona: Phoenix
(2) Colorado: Gunnison
Hayden
(3) Florida: Jacksonville
(4) Illinois: Springfield
(5) Kentucky: Covington (2)
(6) Louisiana: Lake Charles
Patterson
(7) Massachusetts: Boston
(8) Michigan: Oxford
(9) Ohio: North Canton
Swanton
(10) Texas: Dallas (2)
Dallas-Fort Worth (2)
(11) Washington: Seattle
(12) Wisconsin: Racine

b. Distance Measuring Equipment (8 locations)

(1) Alaska: Anchorage
Klawock
(2) Colorado: Denver
Grand Junction
(3) Kentucky: Covington (2)
(4) Texas: Frisco
Uvalde

c. Instrument Landing System (10 locations)

(1) Alaska: Anchorage
Valdez
(2) Kentucky: Covington (2)
(3) Massachusetts: Hyannis
(4) Texas: Dallas-Fort Worth (2)
Frisco
McKinney
(5) West Virginia: Petersburg

d. Microwave Landing System (91 locations)

(1) Colorado: Colorado Springs (2)
Denver (3)
Grand Junction
Gunnison
(2) Connecticut: Groton

(3) Iowa: Ames (2)
  Davenport
  Iowa City
  Newton
  Waterloo

(4) Illinois: Chicago (4)

(5) Kansas: Dodge City
  Garden City (2)
  Great Bend (2)
  Hays
  Hutchinson
  Lawrence
  Olathe
  Parsons
  Topeka (2)
  Wichita

(6) Maryland: Andrews (2)
  Baltimore

(7) Michigan: Grand Rapids
  Lansing
  Menominee
  Romulus

(8) Minnesota: Minneapolis

(9) Missouri: Chesterfield (2)
  Columbia
  Fort Leonard Wood
  Jeff City
  Joplin
  Kaiser
  Kirksville
  Poplar Bluff
  St. Joseph
  St. Louis

(10) Nebraska: Alliance
  Chadron
  Columbus (2)
  Hastings
  Kearney
  Mc Cook
  Scottsbluff

(11) New York: Albany
  Binghamton
  Islip
  La Guardia
  Rochester
  Syracuse (2)

(12) Ohio: Cleveland
  Columbus

(13) Pennsylvania: Erie
  Lancaster
  Philadelphia
  North Philadelphia
  Pittsburgh (3)
  Wilkes Barre

(14) Texas: Lake Jackson
  Mc Allen

(15) Utah: Logan
  St. George
  Salt Lake City (2)

(16) Virginia: Chantilly
  Roanoke

(17) Washington: Pasco
  Pullman
  Spokane (3)
  Wenatchee

(18) West Virginia: Charleston
Clarksburg

e. Omnidirectional Airport Lighting System (4 locations)

(1) Colorado: Denver

(2) Montana: Billings

(3) Oregon: Portland

(4) Utah: Salt Lake City

f. Runway End Identification Light (14 locations)

(1) Alaska: Deadhorse
Yakutat

(2) California: Palo Alto

(3) Illinois: Mattoon

(4) Indiana: Muncie

(5) Kentucky: Murray

(6) Minnesota: Blaine
Maple Lake

(7) Montana: Forsyth

(8) Ohio: Rickenbacker
Swanton

(9) Oregon: Eugene

(10) Tennesse: Jackson

(11) Washington: Everett

g. Runway Visual Range (42 locations)

(1) Alaska: Bethel
Cold Bay
Kenai

(2) Colorado: Arapahoe
Aspen
Denver

(3) Idaho: Lewiston
Twin Falls

(4) Illinois: Chicago (2)
Waukegan
Wheeling

(5) Indiana: Fort Wayne (2)
Indianapolis

(6) Kentucky: Covington (3)

(7) Massachusetts: Westfield

(8) Michigan: Freeland
Port Huron
Romulus (2)
Traverse City

(9) Minnesota: Minneapolis
Rochester

(10) Montana: Missoula

(11) North Dakota: Grand Forks

(12) New Hampshire: Manchester

(13) New Jersey: Teterboro

h. Tactical Air Navigation Equipment (3 locations)

(1) Colorado: Denver
Falcon

i. VHF Omnidirectional Range (8 locations)

(1) Colorado: Denver
Falcon
Grand Junction

(2) Michigan: Romulus

j. Visual Approach Slope Indicator (2 locations)

(1) Maine: Frenchville

(14) Ohio: Canton

(15) Oregon: McMinnville

(16) South Dakota: Rapid City

(17) Texas: Dallas-Fort Worth (2)

(18) Utah: Ogden

(19) Washington: Cedar City
Pasco
Renton
Tacoma

(20) Wisconsin: Manitowoc

(21) Wyoming: Casper

(2) Texas: Uvalde

(3) Texas: East Bernard
Ellington
Uvalde
Woodville

(2) New Hampshire: Berlin

OPERATIONS APPROPRIATION

Maintenance of Traffic Control System

Overtime

		Actual 1987	Actual 1988	Actual 1989	(Est.) 1990	(Est.) 1991
FIELD MAINTENANCE	- Hours	218,785	185,314	194,769	196,519	211,267
	Amount ($000)	3,890	4,356	5,214	5,465	5,971
ENGINEERING	- Hours	10,574	7,977	10,817	12,794	12,721
	Amount ($000)	168	144	223	282	283
PLANNING, DIRECTION & EVALUATION	- Hours	2,643	2,667	3,229	4,158	4,157
	Amount ($000)	47	54	109	135	137
Total	- Hours	232,002	195,958	208,815	213,471	228,145
	Amount ($000)	4,125	4,554	5,546	5,882	6,391

	1988		1989		1990		1991	
Retirements	Eligible	Actual	Eligible	Actual	Eligible	Estimate	Eligible	Estimate
Field Maintenance	1,236	381	1,324	454	1,391	551	1,297	552

OPERATIONS APPROPRIATION

Maintenance of Traffic Control System

Staffing Information

FTP Positions	(Actual) FY 1987	(Actual) FY 1988	(Actual) FY 1989	(Est.) FY 1990	Proposed Change	(Est.) FY 1991
FM	9,278	9,278	9,278	9,279	260	9,539
ENG	675	678	733	732	19	751
PD&E	446	443	443	434	12	446
TOTAL	10,399	10,399	10,454	10,445	291	10,736

Ceiling FTE's						
FM	8,331	8,543	8,688	8,933	415	9,348
ENG	666	734	738	739	0	739
PD&E	437	456	437	438	0	438
TOTAL	9,434	9,733	9,863	10,110	415	10,525

End of Year Employment Information						
FM	8,667	8,646	8,687	8,800	200	9,000
ENG	643	651	750	725	19	744
PD&E	423	454	454	440	12	452
TOTAL	9,733	9,751	9,891	9,965	231	10,196

OPERATIONS APPROPRIATION

Maintenance of Traffic Control System

Resource Summary ($000)

		(Actual) FY 1987	(Actual) FY 1988	(Actual) FY 1989	(Est.) FY 1990	Proposed Change	(Est.) FY 1991
FIELD MAINTENANCE	- PC&B	$381,454	$401,261	$418,939	$453,193	$31,143	$484,336
	O.O.	123,665	132,104	138,422	149,226	5,131	$154,357
	TOTAL	$505,119	$533,365	$557,361	$602,419	$36,274	$638,693
ENGINEERING	- PC&B	$37,713	$39,894	$41,855	$43,095	$1,768	$44,863
	O.O.	12,497	14,060	16,480	19,073	155	$19,228
	TOTAL	$50,210	$53,954	$58,335	$62,168	$1,923	$64,091
PD&E	- PC&B	$20,034	$23,678	$29,269	$30,215	$1,182	$31,397
	O.O.	12,852	17,171	15,141	18,898	(1,907)	$16,991
	TOTAL	$32,886	$40,849	$44,410	$49,113	($725)	$48,388
TOTAL	PC&B	$439,201	$464,833	$490,063	$526,503	$34,093	$560,596
	O.O.	149,014	163,335	170,043	187,197	3,379	190,576
	TOTAL	$588,215	$628,168	$660,106	$713,700	$37,472	$751,172

OPERATIONS APPROPRIATION

Maintenance of Traffic Control System

The estimate for FY 1991 provides a net increase of $37,472,000, 291 FTP positions and 415 FTE's over FY 1990. Changes in the requirements for FY 1991 follow:

($000)

	TOTAL	FIELD MAINT.	PD&E	ENGINEERING
Annualization of FY 1990 WIG's and Gr. to Gr. Promotions.	$6,719	$5,480	$451	$788
New FY 1991 WIG's and Gr. to Gr. Promotions..............	7,303	6,004	494	805
Merit Pay..	1,194	899	115	180
Anticipated Retirements..................................	(4,940)	(4,203)	(247)	(490)
FY 1990 Pay Raise..	3,502	2,918	227	357
FY 1991 Pay Raise..	5,683	5,683	0	0
Inflation..	7,491	6,064	682	745
Extra Day..	1,935	1,665	142	128
Annualization of Field Maintenance Employment (315 FTE's)	9,527	9,527	0	0
Subtotal, Price Level, Annualization, and Other........	38,414	34,037	1,864	2,513
Program Decreases..	(4,112)	(933)	(2,589)	(590)
Program Increases:				
Costs associated with 291 Pos. & 100 FTE's...............	3,170	3,170	0	0
Total Net Increase.......................................	$37,472	$36,274	($725)	$1,923

OPERATIONS APPROPRIATION

Maintenance of Traffic Control System

Price Level, Annualization and Other Nondiscretionary Changes........................ 315 FTE's, $38,414,000

1. $6,719,000 will fund annualization of 3,189 within-grade increases and 1,610 grade-to-grade promotions approved in FY 1990 but effective for only a portion of the fiscal year.

2. $7,303,000 is required for part-year funding of 3,358 within-grade increases and 1,365 grade-to-grade promotions for employees who will become eligible during FY 1991.

3. $1,194,000 will fund 1,523 merit pay increases in FY 1991.

4. A reduction of $4,940,000 is required for anticipated retirements which represents an estimated five percent of the work force and are projected to be replaced with employees at lower grade levels.

5. $3,502,000 is required to cover one quarter of the annualized cost of the FY 1990 3.6 percent pay raise.

6. $5,683,000 is requested to cover one-half of the three-quarter year costs of the 3.5 percent pay raise and the Senior Executive Service pay raise. The remaining 50 percent of the cost in FY 1991 is covered by prudent management of other resources. This will entail more effective position controls such as delays in hiring and backfilling vacancies at lower grades, primarily within the non-safety related areas, and through more efficient management of travel and support contracts.

7. $7,491,000 is due to inflationary and price level increases for travel, transportation of things, supplies and materials, printing and reproduction, and other services.

8. $1,935,000 is a FY 1991 adjustment for an additional compensable work day.

9. $9,527,000 is required to fund 315 FTE's based on part-year employment approved in FY 1990 to support a FY 1990 field maintenance end-of-year employment level of 8,800.

Program Reductions..$-4,112,000

1. A decrease of $4,112,000 is associated with nonrecurring costs for one time equipment purchases and contracts.

OPERATIONS APPROPRIATION

Maintenance of Traffic Control System

Recommended Program Increases.. 291 Positions, 100 FTE's, $3,170,000

1. Increases of $3,170,000, 291 positions, and 100 FTE's are requested for salaries and benefits to supplement the systems maintenance workforce in FY 1991. This increase from the base of $526,503,000 is less than a one percent increase from FY 1990. These increases are based on NAS facility maintenance workload as projected by the Airway Facilities (AF) staffing standard. FAA hopes to bring FM to about 88 percent of the staffing standard in FY 1991 from a current level of approximately 86 percent. In spite of increasing utilization of contractor support for maintenance workload, these additional staff resources are required to bring AF sector FTP employment up to a level that will support the NAS maintenance workload in FY 1991 and beyond. The primary factors driving this increase are the demographics of the field maintenance workforce and the large number of new NAS facilities being added to the system over the next several years.

   The demographics indicate that each year the proportion of inexperienced entry level technicians increases and the number of highly productive journeyman technicians drops. In FY 1991, 16 percent of the FM workforce will be eligible to retire. The losses associated with the high average age of the FM workforce will continue through the mid-1990's. This loss of experience, combined with the large number of new systems that will be added to the NAS over the next several years, requires that we increase FM staffing and begin training new technicians as soon as possible. Without this increase, a mid-FY 1990's gap between NAS maintenance workload and the availability of trained technicians will seriously threaten the efficiency and, ultimately, the safety of the NAS. This request is particularly critical because of the limited hiring done in the FM workforce in the several years prior to FY 1990 and the extensive training required for technicians to become certified on the increasingly complex NAS equipment. Included in this request are 31 positions for technical management of the operational telecommunications program; hazardous material management; and operational NAS Plan transition coordination.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS APPROPRIATION
Leased Telecommunications Services

	Dollar Resources ($000)			Staffing			
	PC&B	Other Objects	Total	FTP Pos.	Total	--Ceiling FTE-- FTP	OTFTP
1. FY 1989 Actual	$0	$244,298	244,298	0	0	0	0
2. FY 1990 Program Level	0	267,638	267,638	0	0	0	0
3. Price Level, Annualization and other non-discretionary changes	0	45,186	45,186	0	0	0	0
4. Program Reductions (Discretionary)	0	(28,963)	(28,963)	0	0	0	0
5. Recommended Program Increases	0	0	0	0	0	0	0
6. FY 1991 Request Level	$0	$283,861	$283,861	0	0	0	0

OPERATIONS APPROPRIATION

Leased Telecommunications

General Justification

For FY 1991, the Leased Telecommunications program will require $283,861,000. This represents a net increase of $16,223,000 over the FY 1990 level for continuation of operational and administrative leased telecommunications services:

1. Operational Telecommunications

This subactivity provides for leased telecommunications services for all operational FAA facilities. Services are either procured by or are contracted with:

a. Defense Commercial Communications Office (DECCO)

The operations portion of the Leased Telecommunications program is procured through DECCO. Department of Defense/FAA procurement of leased telecommunications services is unified to effect maximum economies to the Government. Services include: full-time long distance telephone circuits used to transmit messages pertaining to the flow and control of air traffic operating under instrument flight rule weather conditions; circuits from control points to adjacent air navigation facilities; digital data circuits for collection and distribution of weather information and reports which include notices to airmen concerning runway or other conditions such as inoperative air navigational aids, flight progress reports, and aircraft arrival reports; remote control circuits to connect Air Route Traffic Control Centers (ARTCC's) with remote air/ground transmitters and receivers which provide controllers with direct radio communications with aircraft under their control; radar remoting systems for the transmission of voice and data communications from radar sites to ARTCC's; facsimile services to transmit radar and weather information to Flight Service Stations (FSS's); and dedicated circuits at remote towers and FSS's.

b. Aeronautical Radio, Inc. (ARINC)

The ARINC program provides international air/ground communications at gateway facilities. This includes traffic and services pertaining to flight regulations, distress and safety messages, direction finding, meteorological conditions, notices to airmen, and flight information. ARINC provides these services for FAA at the following gateway facilities: New York, New York; Miami, Florida; San Juan, Puerto Rico; San Francisco, California; and Honolulu, Hawaii.

OPERATIONS APPROPRIATION

Leased Telecommunications

c. Other major leased telecommuncations requirements (not procured through DECCO or ARINC) include:

Telecommunications Management and Operations (TM&O) Program--The TM&O program was initiated to manage the expanding FAA-owned telecommunications system in order to effectively achieve the projected savings associated with implementation of the Radio Communications Link, National Data Interchange Network, Data Multiplexing Network, and Leased Telecommunications. Specifically, it will entail budgetary planning and execution, network planning, circuit engineering, performance tracking, and database management for these telecommunications systems. (Contracted through TSC and private contractors);

Operational Communications Database--Funding for Transportation Systems Center (TSC) to continue to operationally support the FAA Communication Information System during the period of transition to a new Telecommunications Management System. (Contracted through TSC);

National Security Emergency Preparedness (NSEP) Fee--Funding for FAA's share of the total cost of operating the Government-wide telecommunications system which insures continued Government agency access and connectivity with the Public Switched Network during national emergencies; and the

Interim Voice Response System--Funding for a computerized voice system that provides continuously updated weather information to pilots at 16 nationwide locations via touch-tone telephones. (Contracted with Input/Output Services, Inc., Waltham, Massachusetts.)

2. Administrative Telecommunications

This subactivity provides funding for the following FAA-wide services: (a) intercity Federal Telecommunications System (provided through the General Services Administration); (b) Administrative Data Transmission Network which supports national systems such as the Consolidated Personnel Management Information System (DOT-wide), National Flight Data Center, Personal Property In-Use Management System, Uniform Accounting System (DOT-wide), Uniform Payroll System (DOT-wide), Aviation Safety Analysis System, Health Information System, Civil Aviation Security System, Airports Grants Management System, Logistics Inventory System, Instrument Approach Procedures, Uniform Disposal System, Maintenance Management System, Project Materiel System, Project Management System, and networking between all regions, centers, the Washington headquarters, Transportation Computer Center, Transportation Systems Center, flight inspection field offices, four U.S. Coast Guard districts; (c) local telephone service, switchboard operations, and commercial long distance tolls; (d) facsimile network; and (e) the aviation safety and consumer affairs hotline.

OPERATIONS APPROPRIATION

Leased Telecommunications

Initiatives and changes proposed for FY 1991 are summarized below, with details on the following pages.

1. Rates and tariffs for private line, point-to-point operational leased telecommunications services have increased by more than twice the rate of inflation for the past three years. We foresee no change in telephone company business operations or regulatory agency policies that would change this environment. Therefore, we expect this trend to continue.

2. Significant decreases in operational leased telecommunications costs will be accomplished through: (a) reduction of FY 1990 nonrecurring costs; (b) implementation of the Radio Communications Link, i.e., reduction of center-to-center and center-to-tower connectivity, and (c) implementation of FTS 2000.

3. Very aggressive cost controls have been undertaken in the operational leased telecommunications program (e.g., large numbers of circuits have been terminated as better or alternative means to provide service have been instituted; major leased systems such as the Integrated Communication Switching System and multiplexing modems have been purchased using F&E funds, thereby eliminating lease costs; etc.). In addition, stringent management reviews of both new and existing requirements have controlled program growth.

4. All non-discretionary program increases are NAS plan projects and reflect the most current schedules, as provided by project officers. Failure to provide funding will adversely affect NAS plan implementation schedules and planned cost savings and avoidance benefits that would be realized through these programs.

OPERATIONS APPROPRIATION

Leased Telecommunications

Resource Summary ($000)

	(Actual) FY 1987	(Actual) FY 1988	(Actual) FY 1989	(Est.) FY 1990	Proposed Change	(Est.) FY 1991
OPERATIONAL TELECOMMUNICATIONS						
DECCO	$169,705	$173,650	$171,647	$182,298	$ 17,953	$ 200,251
ARINC	8,134	9,058	9,609	9,636	274	9,910
OTHER	11,117	19,699	22,460	30,903	796	31,699
ADMINISTRATIVE TELECOMMUNICATIONS	21,140	22,202	40,582	44,801	-2,800	42,001
Total	$210,096	$224,609	$244,298	$267,638	$ 16,223	$283,861

OPERATIONS APPROPRIATION

Leased Telecommunications

The estimate for FY 1991 provides a net change of $16,223,000 over FY 1990. Changes in requirements for FY 1991 follow:

($000)

	OPERATIONAL				ADMINISTRATIVE
	Total	DECCO	ARINC	Other	Admin
Nondiscretionary Increases:					
Annualization of FY 1990 Recurring Charges	$4,624	$ 4,350	$274	$ 0	$ 0
Inflation	8,832	6,016	318	1,020	1,478
National Security Emergency Preparedness Increase	727	0	0	727	0
Tariff/Fee/Price Increases	3,500	3,500	0	0	0
Continuing Nondiscretionary NAS Plan Costs:					
Automated Weather Observing System (AWOS)	1,138	1,138	0	0	0
Data Multiplexing Network (DMN)	5,970	5,970	0	0	0
Flight Service Automation System (FSAS)	1,276	1,276	0	0	0
Integrated Communication Switching System (ICSS)	2,020	2,020	0	0	0
Long Range Navigation System (LORAN-C)	895	895	0	0	0
Radio Communications Link (RCL) Network	8,112	8,112	0	0	0
Regional Programs	5,723	5,723	0	0	0
Traffic Management System (TMS)	2,000	2,000	0	0	0
Data Multiplexing Network (DMN) Maintenance	369	0	0	369	0
Subtotal, Price Level, Annual. & Other	45,186	41,000	592	2,116	1,478
Program Reductions:					
Nonrecurring Costs (FY 1990)	-19,862	-17,066	-318	-1,020	-1,478
Savings accomplished through implementation of:					
Radio Communication Link (RCL)	-5,981	-5,981	0	0	0
FTS 2000	-2,800	-0	0	0	-2,800
Decrease in Oper. Comm. Data Base (TSC)	-300	0	0	-300	0
Subtotal, Program Reductions	-28,963	-23,047	-318	-1,320	-4,278
Program Increases	0	0	0	0	0
Subtotal, Recommended Program Increases	0	0	0	0	0
Total Net Increase	$ 16,223	$17,953	$ 274	$ 796	$-2,800

OPERATIONS APPROPRIATION

Leased Telecommunications

Price Level, Annualization and Other Nondiscretionary Changes $45,186,000

1. $4,624,000 will fund annualization of recurring charges funded part-year in FY 1990. These costs are for operational leased telecommunications circuits for new facility commissionings, modernization, and expansion of existing services.

2. $8,832,000 is an inflationary increase required to support the level of leased telecommunications services in operation at the end of FY 1990.

3. $727,000 is the nondiscretionary cost assessed to this agency for operating costs of the Government-wide National Security Emergency Preparedness (NSEP) Telecommunications system. Total FY 1991 costs for NSEP are estimated to be $9,152,000.

4. $3,500,000 will fund estimated nondiscretionary tariff/fee/price increases for DECCO.

5. $27,503,000 will fund follow-on National Airspace System (NAS) Plan implementation nondiscretionary costs. FAA is currently midway through implementation of a major effort to modernize the NAS. Capital expenditures for modernization of the NAS are funded from the Facilities and Equipment (F&E) appropriation. Once new systems are put in place, telecommunications costs associated with the systems are funded from the Operations (OPS) appropriation. This is in addition to telecommunications costs associated with existing systems which have not yet been replaced or phased out. FAA must cover these follow-on costs as new systems become operational/implemented.

   a. $27,134,000 increase for services procured through DECCO include $12,021,000 for new and expanded recurring services and $15,113,000 for nonrecurring installation charges. Detailed justification, by major NAS Plan program, for these increases follows:

      1. Automated Weather Observing System (AWOS), $1,138,000

         Funds will cover related follow-on costs associated with implementation of the NAS Plan AWOS program. System implementation began in FY 1989.

OPERATIONS APPROPRIATION

Leased Telecommunications

AWOS obtains weather data (e.g., wind velocity, temperature, dew point, cloud height, visibility, etc.) from various ground sensors and transmits this data directly to pilots using computer-generated voice messages via radio broadcast, telephone dial access, or dedicated circuit to the Service A network. Funding is required for leased lines and hardware costs to transmit data from 64 AWOS units to NAS users. Weather observation data must be available to pilots on a timely basis. In addition, timely observations are essential to improve forecasting.

2. Data Multiplexing Network (DMN), $5,970,000

Funds will cover related follow-on costs associated with implementation of the NAS Plan DMN program. System implementation began in FY 1983.

Data multiplexing enables a number of independent data transmission requirements to be consolidated into a single transmission channel, typically a leased voice-grade private line or Radio Communications Link (RCL) channel. DMN uses this technology to interconnect many FAA facilities, thereby providing many data transmission paths with a minimum number of discrete channels. In the absence of data multiplexing, each data requirement is satisfied with its own circuit, a process which may be much less efficient. DMN also provides integral monitoring of the multiplexing equipment and lines, and improves data service availability by providing redundant transmission paths and automatic switching where required.

Funding is required for continued implementation of Phase 3 of the DMN (increases trunk capacity and adds additional terminal facilities, Automated Flight Service Stations, and various other locations to the network). Traffic to be carried by Phase 3 DMN transmission includes Automated Weather Observing Systems, Next Generation Weather Radar, and Remote Maintenance Monitoring System data. Phase 3 also reconfigures the Phase 1 and 2 network to use RCL transmission facilities. The use of data multiplexing is an integral part of FAA's strategy for cost-effective interfacility communications transmission. Savings result from the opportunity to discontinue existing leased circuits by transferring to the DMN, and cost avoidances are derived from th placement of service for a project on DMN rather than leasing new circuits.

OPERATIONS APPROPRIATION

Leased Telecommunications

3. Flight Service Automation System (FSAS), $1,276,000

Funds will cover related follow-on costs associated with implementation of the NAS Plan FSAS program. System implementation began in FY 1986.

Automation of Flight Service Stations (FSS) is designed to increase facility productivity and assist the FSS system in meeting current and forecasted demands for service. These funds will provide pilots with toll-free access through an 800 number to the Automated Flight Service Stations (AFSS's), and will provide the voice and data circuits required to connect AFSS's with the weather computer system, other AFSS's, FSS's, Air Traffic Control Towers, and Air Route Traffic Control Centers. In addition, funds will allow for required continuity of essential services during the transition from FSS's to AFSS's.

4. Integrated Communications Switching System (ICSS), $2,020,000

Funds will cover related follow-on costs associated with implementation of the NAS Plan ICSS program. System implementation began in FY 1983.

ICSS provides voice communications switching systems for new, replaced, or modernized Air Traffic Control Towers and TRACON's (previously provided with leased TELCO equipment), and for facilities which have obsolete equipment which can no longer be maintained. Funds are required for non-recurring operations costs associated with new Type 3 systems to be commissioned in FY 1991.

5. Long Range Navigation System (LORAN C), $895,000

Funds will cover related follow-on costs associated with implementation of the NAS Plan LORAN C program. System implementation began in FY 1989.

LORAN C is a low frequency hyperbolic radio navigation system maintained and operated by the U. S. Coast Guard. The FAA project is intended to meet a growing demand from the aviation community for LORAN C area navigation/landing aid services. LORAN C provides overland coverage to about two-thirds of the land area of the Continental U.S. (CONUS). This service is principally used for air navigation by general aviation and off-shore helicopter operations in low-altitude and/or remote areas not well served by Very High Frequency Omnidirectional Range/Distance Measuring Equipment. Two major services will result from this project: single level or better coverage for en route and terminal Instrument Flight Rules (IFR) navigation from the entire CONUS; and published, non-precision IFR approaches at designated airports. Funding is required for leased circuits for all 197 LORAN C signal monitors.

OPERATIONS APPROPRIATION

Leased Telecommunications

6. Radio Communications Link (RCL) Network, $8,112,000

Funds will cover related follow-on costs associated with implementation of the NAS Plan Radar Microwave Link Replacement and Expansion Program. System implementation began in FY 1986.

The RCL network is an integrated voice and data transmission system which builds upon the Radar Microwave Link (RML) system currently in use. Reductions in leased line requirements are possible by rerouting more circuits from remote communications and navigation facilities over selected FAA-owned RML's. Funding will allow upgrading of TELCO access to existing RML sites and expansion of access to new RCL segments. RCL implementation will result in savings (rerouting circuits from remote communications and navigation facilities over selected RML's and transitioning large numbers of leased circuits onto the new RCL).

7. Regional Programs, $5,723,000

Funds will cover related follow-on costs associated with regional programs, including implementation of numerous on-going NAS Plan programs and support for regionally originated programs (such as facility establishments, relocations, and changes resulting from air traffic patterns).

Examples of major regional program activities include the Expanded East Coast Plan and Central Region's airspace resectorization plan. In each of these cases, air traffic control patterns over large geographic areas are being changed, and communications (interphone, radio, etc.) must follow. In addition, there are regional projects which establish, relocate, or modernize facilities (Air Traffic Control Towers, radio outlets, radios, etc.). In most cases, these projects involve concomitant communication changes and additions.

8. Traffic Management System (TMS), $2,000,000

Funds will cover related follow-on costs associated with implementation of the NAS Plan TMS program. System implementation began in FY 1982.

TMS is an existing network of Air Traffic Control Specialists, meteorologists, and automation specialists who collectively provide nationwide monitoring, management, and analysis of air traffic flow. Computers, weather radar display terminals and high speed communications are essential to accomplish these functions. This project provides for upgrading of the existing system (e.g., improving air traffic system efficiency, minimizing delays, expanding services, and becoming more responsive to user requirements) into a fully integrated TMS operating nationally at the Washington headquarters (Central Flow Control function), and locally through traffic management units in each Air Route Traffic Control Center designated level 5 terminals, and later at area control facilities. Funding is required for the annual telecommunications lease costs necessary to connect TMS component facilities.

b. $369,000 increase for other operational leased telecommunications recurring services (not procured through DECCO):

DMN Maintenance, $369,000

Funding is required for additional contractor maintenance on DMN Phase III equipment. DMN Phase III will: allow increased trunk capacity at additional terminals and AFSS's; provide high capacity digital links; and provide services and equipment for new NAS requirements.

Program Reductions (discretionary)...$28,963,000

1. $19,882,000 is a reduction of nonrecurring costs associated with operational telecommunications services initiated during FY 1990 for new facilities and expanded services.

2. $5,981,000 in savings accomplished through implementation of the Radio Communications Link ($5,981,000). This decrease results from reductions in maintenance costs, while providing improved services and system expansion, improved reliability, reductions in leased-line requirements, and consolidation of communications within FAA to ensure necessary system compatibility. Savings are predicated on timely conversion of communications requirements from commercially leased lines to the FAA's RCL network.

3. $2,800,000 in savings accomplished through implementation of FTS 2000. This decrease results from the reduced pricing available through the FTS 2000 contract. This new system provides data transmission service as well as voice. FTS 2000 cut-over for existing voice capability began in October 1989 and is scheduled to end in June 1990. Conversion of other existing capabilities to FTS 2000 will be on-going for at least a 2-3 year period subject to AT&T's ability to meet projected requirements.

4. $300,000 is a reduction due to completion of various database development activities.

Recommended Program Increases..$0

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS APPROPRIATION
Administration of Aviation Standards

	Dollar Resources ($000)			Staffing			
					Ceiling FTE		
	PC&B	Other Objects	Total	FTP Pos.	Total	FTP	OTFTP
1. FY 1989 Actual	$272,558	$96,734	369,292	6,059	5,341	5,284	57
2. FY 1990 Program Level	316,984	104,282	421,266	6,673	5,860	5,797	63
3. Price Level, Annualization and other non-discretionary changes	30,550	5,605	36,155	0	335	335	0
4. Program Reductions (Discretionary)	(24)	(2,067)	(2,091)	0	0	0	0
5. Recommended Program Increases	14,229	879	15,108	663	246	246	0
6. FY 1991 Request Level	$361,739	$108,699	$470,438	7,336	6,441	6,378	63

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

General Justification

For FY 1991, the operation of the Aviation Standards Program will require 7,336 FTP positions and 6,441 FTE's and $470,438,000. This represents an increase of 663 positions and 581 FTE's and $49,171,000 over the FY 1990 level.

The primary objectives of this program are: (1) promote aviation safety and (2) safeguard passengers, crew aircraft, and airports from the threat of violence of hijacking, sabotage, and other criminal acts in accordance with Public Law 93-366, Anti-Hijacking Act of 1974 and Public Law 99-83, International Security and Development Cooperation Act of 1985, as amended.

Administration of the Aviation Standards Program includes the development, publication, and administration of the safety standards, rules, and regulations applicable to airmen, aircraft, and operations involved in all United States civil aviation throughout the world, and foreign operations into and over United States territory. This program also provides for monitoring the accuracy of signals emitted by the aids to air navigation. Flight procedures are also developed for use by United States civil and military aviation and foreign air carriers operating into the United States. It also includes a system of registration and recordation of airmen and aircraft as provided by Title V of the Act.

Operation and Maintenance

This subactivity covers the cost of certification and inspection activities associated with the operation and maintenance of aircraft by air carriers and the general aviation community. With regard to air carriers, inspectors check qualifications of pilots and other airmen through flight tests and written examinations, and exercise continuing surveillance over enroute operations, training programs, and maintenance shops and procedures. In the general aviation area, appropriate practical and written examinations, flight tests, and surveillance are provided pilots and mechanics. Surveillance is also maintained over air taxi operations, fixed-based operators, aerial applicators, training schools, shops, and repair stations to determine that operations and maintenance are in conformance with safety regulations.

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Aircraft Certification

Included within this subactivity are the costs associated with development and administration of safety standards governing the type, production, and original airworthiness certification of aircraft, engines, propellers, appliances, and noise level certification. The FAA's responsibility in this area begins with the development of standards, continues with the examination of applications of certifications, and carries through to the engineering design and flight test phases. Following design approval, the FAA's responsibilities extend to the approval of quality control procedures for production, the determination that each product is of the proper configuration for safe operations, and the assurance that corrections are made for any difficulties encountered in actual service.

Civil Aviation Security

This subactivity provides for the overall planning, direction, management, evaluation and enforcement of civil aviation security. The primary objective of the Civil Aviation Security Program is to safeguard passengers, crew, aircraft, and airports from the threat of hijacking, sabotage, and other criminal acts in accordance with the Anti-Hijacking Act of 1974 (Public Law 93-366), and the International Security and Development Cooperation Act of 1985 (Public Law 99-83). Additional legislation, such as the Anti-Drug Abuse Act of 1988 (Public Law 100-690), mandates the FAA's involvement in the fight against the flow of illegal drugs into the United States. Also, Public Law 100-235, January 8, 1988, mandates security for automated information systems, and requires mandatory training for all persons involved in management and use or operation of Federal computer systems that contain "sensitive information."

This subactivity has statutory responsibilities to ensure that foreign carriers operating to, from, and within the United States, and domestic carriers operating throughout the world, implement effective security programs. This includes developing countermeasures against criminal and/or terrorist threats against U.S. airports and aircraft, and providing technical assistance, training and guidance in required security measures to airports, air carriers and other regulated parties. The program has been expanded to include the increased use of Federal Air Marshals (FAM's), the enhanced assessment and monitoring of foreign and domestic airports and air carriers, and the implementation of Secretarial initiatives to increase civil aviation security presence in foreign locations.

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Flight Program and Management of Aircraft

This subactivity contains resources for operating costs such as fuel and line maintenance of the FAA-owned and rented aircraft, major maintenance of the FAA-owned aircraft, flight crews required to perform flight inspection and procedure functions, flight procedures specialists, flight inspection data analysis, and personnel associated with the management of aircraft. The types of aircraft operated range from relatively simple single-engine rental aircraft to long-range multi-engine aircraft. These aircraft are used for in-flight evaluation of air traffic control and flight procedures, in-flight inspection of electronic aids employed in civil and military systems of air navigation, and transport of personnel in performance of inspection duties and other assigned job functions.

Medical

This subactivity provides resources for the staffing and operation of FAA's aviation medical program. The activities of this program are significant in maintaining a high level of aviation safety and providing for the health and safety of FAA employees. The most recent addition to this subactivity is the responsibility for the Aviation Industry Drug Program, driven, in part, by DOT Final Rule of "Procedures for Transportation Workplace Drug Testing Program (December 1, 1989) and the FAA Final Rule on "Anti-Drug Program for Personnel Engaged in Specified Aviation Activities (November 21, 1988). Other medical programs include: Airmen medical certification, aviation medical examiner system, Air Traffic Controller (ATC) and other safety related medical examinations, medical aircraft accident investigation, airmen medical standards, occupational health services, airmen education, and medical research direction.

Records Servicing and Analysis

This subactivity includes resources for the issuance of airmen certificates, registration of civil aircraft, and recordation of conveyances affecting title to U.S. civil aircraft components. Increased emphasis has been placed on modernizing the Airmen and Aircraft Registry due to enhanced requirements legislated by the FAA Drug Enforcement Assistance Act of 1988 (Public Law 100-690). The fiscal year 1990 authorizing legislation for the FAA Operations Appropriation includes language that permits the collection of users' fees to be credited to the appropriation.

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Planning, Direction and Evaluation

The overall planning, direction, management, and evaluation of the Aviation Standards activities, including development of safety regulations and accident investigations are programmed under this subactivity.

Aviation Safety

The primary objective of this program is to maximize aviation safety. Responsibilities encompass the following: establishing national safety policy; reviewing elements of the National Airspace System; developing safety education programs; assessing the adequacy and effectiveness of evaluations and quality assurance programs within key safety areas of air traffic control, flight standards, airway facilities, airports, aircraft certification, and civil aviation security; analysis, maintenance, and reporting of FAA safety data bases; developing safety indicators; and serving as the principal advisor to the Administrator concerning safety matters.

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Initiatives and Changes for FY 1991 are summarized below, with details on the following pages.

1. Aviation inspector and support workforce: An increase of 400 positions, 113 FTE's and $6,159,000 is requested in FY 1991. This increase is required to continue to bring staffing levels in line with safety requirements.

2. An additional 35 positions, 18 FTE's and $1,080,000 are requested for the Aircraft Certification program. These positions are required as a result of aging aircraft. This, combined with other internal adjustments, will increase the staff devoted to aging aircraft from 27 positions in FY 1990 to 120 positions in FY 1991.

3. An additional 164 positions, 89 FTE's and $6,145,000 are requested for Civil Aviation Security. These resources are requested to increase Civil Aviation Security staffing at regional and overseas security offices.

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Workload Measures

Activity	Volume of Activity Actual 1988	Actual 1989	Estimate 1990	Estimate 1991	Percent Change 1988 1989	1989 1990	1990 1991
Aircraft Certification							
Continued Airworthiness							
Number of Currently Held Type Certificates	1,732	1,819	1,855	1,890	5.0	2.0	1.9
Number of Airworthiness Directives (AD's) Issued	353	360	390	449	2.0	8.3	15.1
Number of Production Quality Control Systems	1,547	1,605	1,667	1,748	3.7	3.9	4.9
Number of Designees Supervised	2,693	2,865	3,023	3,129	6.4	5.5	3.5
Number of Designee Organizations Supervised	53	75	82	90	41.5	9.3	9.8
Number of Enforcement Action Cases Closed	83	159	195	232	91.6	22.6	19.0
Regulation and Policy Development							
Regulatory Documents Issued	165	80	97	111	-51.5	21.3	14.4
Guidance Documents Issued	24	50	92	72	108.3	84.0	-21.7
Certification							
Number of New or Amended Type Certificates	178	150	190	191	-15.7	26.7	0.5
Number of Supplemental Type Certificates	1,596	1,121	1,208	1,280	-29.8	7.8	6.0
Number of Technical Standard Order and Parts Manufacturer Approvals Issued	2,896	3,554	3,630	3,711	22.7	2.1	2.2
Number of Production Certificates and Approved Production Inspection Systems Issued or Amended	53	48	85	100	-9.4	77.1	17.6
Number of Airworthiness Certificates Issued	6,029	5,219	5,622	5,895	-13.4	7.7	4.9

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Workload Measures

	Volume of Activity				Percent Change		
Activity	Actual 1988	Actual 1989	Estimate 1990	Estimate 1991	1988 1989	1989 1990	1990 1991
Operation and Maintenance							
Airman Certification	133,644	147,533	159,122	171,898	10.4	7.9	8.0
Operator Certification	82,522	92,525	100,419	108,867	12.1	8.5	8.4
Investigations	49,899	59,355	64,629	69,932	19.0	8.7	8.2
Inspections	226,193	281,857	290,054	297,267	24.6	2.9	2.5
Records Servicing & Analysis							
Aircraft Registration							
Examinations	257,980	263,139	426,901	432,269	2.0	62.2	1.3
Records Update	284,780	290,475	377,784	385,339	2.0	30.1	2.0
Correspondence	32,446	33,094	44,555	45,230	2.0	34.6	1.5
Cashier	127,400	129,948	209,246	213,430	2.0	61.0	2.0
Coding	31,491	32,120	41,912	42,750	2.0	30.5	2.0
Airmen Certifications							
Examinations (applications)	185,965	187,825	414,703	641,600	1.0	120.8	54.7
Written tests	201,362	203,376	205,410	207,464	1.0	1.0	1.0
Change of address	91,150	92,062	92,982	93,912	1.0	1.0	1.0
Legal actions	14,172	14,314	14,457	14,602	1.0	1.0	1.0
Mail	290,748	293,655	521,592	749,558	1.0	77.6	43.7
File maintenance	7,435	7,509	7,584	7,660	1.0	1.0	1.0
Flight Program and Management of Aircraft							
Flight Hours							
Flight Inspection	18,950	21,043	24,507	24,507	11.0	16.5	0
Evaluation, Currency & Transp.	23,513	23,349	24,668	24,668	-0.7	5.6	0
Logistics	180	674	569	569	374.4	-15.6	0
Training	6,967	7,719	8,505	8,505	10.8	10.2	0

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Workload Measures

Activity	Volume of Activity Actual 1988	Actual 1989	Estimate 1990	Estimate 1991	Percent Change 1988 1989	1989 1990	1990 1991
Development of Flight Procedures	18,455	18,457	31,300	32,600	.0	69.6	4.2
Number of Facilities Requiring Flight Inspection	5,434	5,535	6,328	6,428	1.9	14.3	1.6
Civil Aviation Security							
Investigations Employee misconduct and theft of FAA property	1,676	1,909	2,713	2,833	13.9	42.1	4.4
Drug Interdiction	0	28,364	30,249	31,044	-	6.6	2.6
Internal Security (Personnel, physical, information, and computer security)	24,344	31,566	43,749	42,272	29.7	38.6	-3.4
Modular Applicant Testing, Examining and Screening (MATES)	935	12,606	14,760	17,415	1,248.2	17.1	18.0
Domestic Airport Inspections (Comprehensive & Supplemental)	1,182	1,474	1,546	1,633	24.7	4.9	5.6
Domestic Air Carrier Inspections (Comprehensive & Supplemental)	9,331	10,634	11,088	11,588	14.0	4.3	4.5
Domestic Airport/Air Carrier Hazard Materials (Comprehensive & Supplemental)	5,447	6,550	7,500	9,000	20.2	14.5	20.0
Hazardous Materials at Foreign Airports	110	197	210	260	79.1	6.6	23.8

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Workload Measures

Activity	Volume of Activity Actual 1988	Actual 1989	Estimate 1990	Estimate 1991	Percent Change 1988 1989	1989 1990	1990 1991
Part 109 (Cargo Security) Surveys	0	1,310	1,860	2,375	-	42.0	27.7
Domestic Foreign Air Carriers Inspections at U.S. Airports (Comprehensive & Supplemental)	2,778	3,291	3,363	3,483	18.5	2.2	3.6
Foreign Airport Assessments	258	263	345	364	1.9	31.2	5.5
U.S. Carrier Foreign Station Inspections	712	791	856	930	11.1	8.2	8.6
Foreign Air Carrier (Last Point of Departure)	312	343	396	420	9.9	15.5	6.1
Enforcement (Citing of violations and issuance of regulations)	6,214	5,724	6,697	16,568	-7.9	17.0	147.4

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Workload Measures

Activity	Volume of Activity Actual 1988	Actual 1989	Estimate 1990	Estimate 1991	Percent Change 1988 1989	1989 1990	1990 1991
Medical							
Airmen Medical Certification Applications Processed	462,631	482,518	500,382	520,397	4.1	3.6	4.0
Airmen Medical Reconsideration Applications Processed	889	700	300	300	-21.3	-57.1	-
Physical Examinations Performed							
a. Conducted by FAA Medical Staff	6,933	8,110	8,358	9,976	14.5	3.0	19.4
b. Conducted by Aviation Medical Examiners	19,240	24,747	26,192	28,811	22.3	5.5	10.0
Industrial Hygiene Consultation/Inspections/Investigations/Surveys	140	180	175	175	28.6	-2.9	-
Airmen Medical Education Activities Conducted	872	998	840	876	14.4	-18.8	4.3
Aviation Medical Examiners Designated	317	385	150	150	21.5	-61.0	-

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Workload Measures
Operational Activity Based on Actual and Projected Growth Rate

Activity Accident Investigation	Volume of Activity				Percent of Change		
	Actual 1988	Actual 1989	Estimate 1990	Estimate 1991	1988 1989	1989 1990	1990 1991
NTSB Recommendations Received	112	120	125	130	7.1	4.2	4.0
Accidents/Incidents Investigated	63	65	75	85	3.2	15.4	13.3

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Workload Measures

Activity	Volume of Activity Actual 1988	Actual 1989	Estimate 1990	Estimate 1991	Percent Change 1988 1989	1989 1990	1990 1991
Aviation Safety							
* Reports in FAA Safety Data Bases	4,897	4,808	5,500	6,200	-1.8	14.5	12.7
Safety Hotline Reports	864	1,000	1,150	1,300	34.1	16.5	11.1
Passenger Safety Office Issue	120	0	150	150	-100.0	--	--
Aviation Safety Reporting System Reports	21,022	31,042	44,000	58,000	47.7	41.7	31.8

*Near midair collisions, operational errors/deviations, pilot deviations, and pedestrian/vehicle deviations.

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Aviation Safety Field Inspectors and Support Personnel
($ in thousands)

	FY 1989 Actual		FY 1990 Estimated		FY 1991 Estimated	
	Authorized Positions	End-of-Year Employment	Authorized Positions	End-of-Year Employment	Authorized Positions	End-of-Year Employment
General Aviation Inspectors	1,429	1,335	1,603	1,496	1,777	1,671
Air Carrier Inspectors	1,029	976	1,155	1,079	1,281	1,204
Total, Aviation Safety Inspectors	2,458	2,311	2,758	2,575	3,058	2,875
Personnel in support of inspectors	595	469	695	469	795	469
Total	3,053	2,780	3,453	3,044	3,853	3,344

NOTE: This chart excludes all other type positions in the Operation and Maintenance subactivity.

* Aviation Safety Inspector positions reflect adjustments which support enforcement, training and policy/planning functions which directly impact the Flight Standards surveillance activities. FY 1990 estimates are based on FY 1989 adjustments and are under review to meet FY 1990 previously established staffing requirements.

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Resource Summary ($000)

		Actual FY 1987	Actual FY 1988	Actual FY 1989	Estimate FY 1990	Proposed Change	Estimate FY 1991
Operation and Maintenance -	PC&B	121,498	137,821	154,028	180,701	24,376	205,077
	O.O.	20,474	22,265	22,725	25,534	859	26,393
	Total	141,972	160,086	176,753	206,235	25,235	231,470
Certification -	PC&B	34,256	38,138	39,979	44,839	5,243	50,082
	O.O.	4,620	5,784	6,015	6,778	223	7,001
	Total	38,876	43,922	45,994	51,617	5,466	57,083
Civil Aviation Security -	PC&B	17,334	20,406	23,822	29,297	12,016	41,313
	O.O.	7,090	7,542	8,197	8,918	1,643	10,561
	Total	24,424	27,948	32,019	38,215 *	13,659	51,874
Flight Program & Management of Aircraft -	PC&B	30,475	33,121	34,946	36,999	1,413	38,412
	O.O.	27,760	29,435	30,128	29,721	824	30,545
	Total	58,235	62,556	65,074	66,720	2,237	68,957
Records Servicing and Analysis -	PC&B	2,598	2,721	2,910	3,228	746	3,974
	O.O.	1,122	1,088	1,224	746	906	1,652
	Total	3,720	3,809	4,134	3,974	1,652	5,626

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Resource Summary ($000)

		Actual FY 1987	Actual FY 1988	Actual FY 1989	Estimate FY 1990	Proposed Change	Estimate FY 1991
Medical -	PC&B	7,386	7,742	9,114	10,474	461	10,935
	O.O.	4,281	9,481	5,796	9,432	(12)	9,420
	Total	11,667	17,223	14,910	19,906	449	20,355
Planning, Direction and Evaluation -	PC&B	2,787	3,455	5,241	7,189	245	7,434
	O.O.	13,123	10,234	13,229	12,343	(26)	12,317
	Total	15,910	13,689	18,470	19,532	219	19,751
Total Compliance & and Regulatory	PC&B	216,334	243,404	270,040	312,727	44,500	357,227
	O.O.	78,470	85,829	87,314	93,472	4,417	97,889
	Total	294,804	329,233	357,354	406,199	48,917	455,116
Aviation Safety -	PC&B	2,431	2,673	2,518	4,257	255	4,512
	O.O.	5,582	6,414	9,420	10,810	0	10,810
	Total	8,013	9,087	11,938	15,067	255	15,322
TOTAL	PC&B	218,765	246,077	272,558	316,984	44,755	361,739
	O.O.	84,052	92,243	96,734	104,282	4,417	108,699
	Total	302,817	338,320	369,292	421,266 *	49,172	470,438

* Includes $734,000 unobligated balances carried forward that were previously appropriated to support the Federal Air Marshall Program.

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Staffing Information

FTP Positions	Actual FY 1986	Actual FY 1987	Actual FY 1988	Actual FY 1989	Estimate FY 1990	Proposed Change	Estimate FY 1991
Operation and Maintenance.......	2,419	2,780	2,994	3,374	3,796	406	4,202
Certification..................	793	800	806	823	883	35	918
Civil Aviation Security.........	429	429	516	572	684	164	848
Flight Program & Management of Aircraft.......................	821	782	782	774	778	4	782
Records Servicing and Analysis..	98	98	98	98	98	43	141
Medical........................	224	227	227	249	254	6	260
Planning, Direction & Evaluation	61	59	72	118	121	0	121
Total Regulatory & Compliance...	4,845	5,175	5,495	6,008	6,614	658	7,272
Aviation Safety................	41	42	42	51	59	5	64
TOTAL	4,886	5,217	5,537	6,059	6,673	663	7,336

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Staffing Information

Ceiling FTE's	Actual FY 1986	Actual FY 1987	Actual FY 1988	Actual FY 1989	Estimate FY 1990	Proposed Change	Estimate FY 1991
Operation and Maintenance.......	2,213	2,525	2,734	2,949	3,292	314	3,606
Certification..................	685	682	717	734	773	63	836
Civil Aviation Security.........	342	398	433	496	563	178	741
Flight Program & Management of Aircraft......................	728	691	709	718	731	1	732
Records Servicing and Analysis..	103	100	98	98	97	22	119
Medical........................	204	210	208	231	246	3	249
Planning, Direction & Evaluation	57	60	71	73	98	0	98
Total Regulatory & Compliance...	4,332	4,666	4,970	5,299	5,800	581	6,381
Aviation Safety.................	39	40	45	42	60	0	60
TOTAL	4,371	4,706	5,015	5,341	5,860	581	6,441

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Staffing Information

End-of-Year Employment Information	Actual FY 1986	Actual FY 1987	Actual FY 1988	Actual FY 1989	Estimate FY 1990	Proposed Change	Estimate FY 1991
Operation and Maintenance.......	2,475	2,648	2,909	3,193	3,457	300	3,757
Certification..................	669	707	733	751	811	35	846
Civil Aviation Security.........	379	404	478	511	630	170	800
Flight Program & Management of Aircraft......................	703	701	717	725	725	4	729
Records Servicing and Analysis..	100	98	98	95	96	43	139
Medical.........................	194	204	207	233	233	6	239
Planning, Direction & Evaluation	58	61	67	96	98	0	98
Total Regulatory & Compliance...	4,578	4,823	5,209	5,604	6,050	558	6,608
Aviation Safety.................	39	44	46	49	59	0	59
TOTAL	4,617	4,867	5,255	5,653	6,109	558	6,667

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program ($000)

	OPERATIONS & MAINTENANCE	AIRCRAFT CERT.	CIVIL AVIATION SECURITY	AIRCRAFT	RECORD SERVICING & ANALYSIS	MEDICAL	PLANNING DIRECTION & EVALUATION	TOTAL REGULATORY & COMPLIANCE	SAFETY	TOTAL AVIATION STANDARDS
Price Level, Annualization and Etc.:										
1. Annual. of FY 90 Within Grade Increases	1,174	210	201	174	16	3	5	1,783	20	1,803
2. Annual. of FY 90 FTE Increases	10,956	2,583	3,884	0	0	0	0	17,423	0	17,423
3. Merit Pay	783	99	109	123	2	20	32	1,168	46	1,214
4. New FY 91 Within Grade Increases	1,213	204	228	177	18	52	6	1,898	43	1,941
5. Savings Due to Retirements	(682)	(120)	(115)	(167)	(13)	(47)	(17)	(1,161)	(3)	(1,164)
6. Inflation	891	210	254	1,111	40	167	413	3,086	349	3,435
7. COLA	0	0	822	0	0	0	0	822	0	822
8. Extra Day	670	168	103	148	11	35	23	1,158	18	1,176
9. Annualization of 1990 Pay Raise	1,522	389	240	345	25	85	53	2,659	42	2,701
10. Jan 1991 Pay Raise (incl SES)	2,549	686	399	568	40	160	143	4,545	89	4,634
11. Annul. of 1990 Security International pos.	0	0	1,123	0	0	0	0	1,123	0	1,123
12. K-9 Contract	0	0	345	0	0	0	0	345	0	345
13. Guard Service & Security Invest	0	0	702	0	0	0	0	702	0	702
Subtotal, Price Level, Annualization	19,076	4,429	8,295	2,479	139	475	658	35,551	604	36,155
Program Reductions:										
1. Refurbish Furn./Equip	0	10	0	0	0	0	0	10	0	10
2. Consultant Services	0	9	0	0	0	0	0	9	0	9
3. Overtime	0	24	0	0	0	0	0	24	0	24
4. One-Time Equipment Purchase	0	0	47	0	0	0	0	47	0	47
5. One-Time Costs/Management Initiatives	0	0	0	287	13	179	439	918	349	1,267
6. Security No-year Funds	0	0	734	0	0	0	0	734	0	734
Subtotal, Recommended Program Reductions	0	43	781	287	13	179	439	1,742	349	2,091

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program ($000)

	OPERATIONS & MAINTENANCE	AIRCRAFT CERT.	CIVIL AVIATION SECURITY	AIRCRAFT	RECORD SERVICING & ANALYSIS	MEDICAL	PLANNING DIRECTION & EVALUATION	TOTAL REGULATORY & COMPLIANCE	SAFETY	TOTAL AVIATION STANDARDS
Program Increases:										
1. Aviation Safety Inspectors	6,150	0	0	0	0	0	0	6,158	0	6,158
2. Certification Staffing	0	1,080	0	0	0	0	0	1,080	0	1,080
3. Security Staffing	0	0	6,145	0	0	0	0	6,145	0	6,145
4. Flight Procedures Workload	0	0	0	45	0	0	0	45	0	45
5. Drug Enforcement Assistance Act of 1988	0	0	0	0	1,526	0	0	1,526	0	1,526
6. Drug Abatement Program	0	0	0	0	0	153	0	153	0	153
Subtotal, Recommended Program Increases	6,150	1,080	6,145	45	1,526	153	0	15,108	0	15,108
TOTAL AXR PROGRAM	25,235	5,406	13,650	2,237	1,852	449	219	48,917	255	49,172

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

Price Level, Annualization and Other Non-discretionary Changes.........................335 FTE's, $36,155,000

1. $1,803,000 will fund annualization of 2,501 within-grade increases in FY 1990, but effective for only a portion of the fiscal year.

2. $17,423,000 is required to fund 335 FTE's (201 FTE's for aviation inspectors and support, 45 FTE's for Aircraft Certification, 89 FTE's for Civil Aviation Security), based on part-year employment for positions approved in FY 1990.

3. $1,214,000 will fund 1,198 merit pay increases in FY 1991.

4. $1,941,000 is required for part-year funding of 2,594 within-grade increases for employees who will become eligible during FY 1991.

5. A reduction of $1,164,000 is proposed for anticipated retirements.

6. $3,435,000 is due to inflationary and price level increases for travel, transportation of things, supplies and materials, printing and reproduction, and other services.

7. $822,000 is required to annualize the housing and cost of living allowances for the increased international security positions during FY 1990.

8. $1,176,000 is an FY 1991 adjustment for an additional compensable work day. FY 1991 contains 261 compensable work days.

9. $2,701,000 is requested to cover one quarter of the annualized cost of the FY 1990 3.6% pay raise.

10. $4,634,000 is requested to cover one-half of the three-quarter year costs of the FY 1991 3.5% pay raise and the Senior Executive Service pay raise. The remaining 50 percent of the cost in FY 1991 is covered by prudent management of other resources. This will entail more effective position controls such as delays in hiring and backfilling vacancies at lower grades, primarily within the non-safety related areas, and through more efficient management of travel and support contracts.

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

11. An increase of $1,123,000 is required to annualize the increased costs associated with filling the additional international security positions during FY 1990.

12. An increase of $345,000 is required over the base of $367,000, for increased contract costs associated with the FAA-sponsored Explosive Detection K-9 Team Program. Training is conducted under agreement with the U.S. Air Force Military Training Center at Lackland AFB, Texas, as authorized by Section 529, Title V of the Tax Equity and Fiscal Responsibility Act of 1982, Public Law 97-248, and Section 316(c) of the Federal Aviation Act. This contract includes funding for travel and training of civilian local airport law enforcement handlers and dogs participating in the program, dog procurement, and scheduled evaluations of operational teams by the U.S. Air Force. This increase would assist local jurisdictions participating in the program to continue to maintain the K-9 teams resulting in the ability to detect explosive devices in checked baggage, on board airplanes and in other locations in airports.

13. An increase of $702,000 is required over the base of $596,000 to fund the guard service and the security investigations service for FOB-10A. This service is necessary to ensure the security of FOB-10A, as well as that of employees and classified information, protect access to sensitive areas, and to guard against theft of property from the government. This increase is necessary as a result of the Department's contract entering the option years in which the contractor has adjusted the inflation factor to reflect current pricing.

Recommended Program Reductions..$-2,091,000

1. A decrease of $10,000 for refurbishing furniture and equipment.

2. A decrease of $9,000 for contractual services.

3. A decrease of $24,000 in overtime in the Aircraft Certification subactivity.

4. A decrease of $47,000 for one-time equipment purchases.

5. A savings due to one-time costs and management initiatives that are expected to occur in FY 1990 will reduce the base in FY 1991 by $1,267,000.

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

6. An adjustment for unobligated balances carried forward into FY 1990 that were previously appropriated to support the Federal Air Marshall Program, $734,000.

Recommended Program Increases....................................663 Positions, 246 FTE's, and $15,108,000

OPERATIONS and MAINTENANCE

1. Aviation Safety Inspector, Support and Technical: 406 Positions, 113 FTE's, $6,159,000.

An increase of $6,159,000 to fund 300 aviation safety inspector and 100 aviation safety support positions, and 113 FTE's is required to continue bringing staffing levels in line with safety requirements. The additional funds will provide an end-of-year employment level of 2,875 for aviation safety inspectors, with hiring occurring over the last three quarters of the fiscal year--a 12 percent increase over 2,575 expected employment by the end of FY 1990. Employment for direct support staff in fiscal years 1990 and 1991 will be maintained, at a minimum, at the FY 1989 level.

The increase in safety inspectors is necessary to perform the work specified in the staffing standard. The staffing standard is based on task and time data which define and quantify critical safety inspections and surveillance. The standard provides for the time required for job-essential training and incorporates functions and tasks associated with the National Aviation Safety Inspection Program (NASIP) and the National Program Guidelines (NPG). The NASIP program directs periodic, major, in-depth inspections of air carriers, pilot flight schools, repair stations, commuter air carriers, rotorcraft external load operators, and maintenance technician schools. The NPG is an annual work program which institutes mandatory guidelines that ensure certain inspections will be systematically performed at specified frequencies.

Also the additional positions are requested to develop and implement new rules governing certification of flight crews to operate new-generation aircraft; ensure a requisite level of safety in newly certificated foreign repair stations; and to provide for U.S. participation with foreign manufacturers and regulatory agencies in the development of joint airworthiness regulations.

Six (6) positions are required for technical personnel who will work on maintenance programs for aging aircraft, updating Federal Aviation Regulations regarding the Part 121 and 135 air carrier certification processes, operational requirements for state-of-the-art avionics, flight control, and propulsion systems, accident prevention programs, and advanced qualification programs for flight crews. This is technical work which is regulatory in nature and must be accomplished by headquarters staff in a timely manner to ensure service to the public and safety in air commerce.

AIRCRAFT CERTIFICATION

2. Aging Aircraft Staffing: 35 positions, 18 FTE's and $1,080,000.

These positions are required to meet the aging aircraft workload requirements within the Aircraft Certification Regulatory Program (ACRP). The recent emphasis on aging aircraft concerns has led to a re-evaluation of engineering aspects that directly contribute to the continued safe operation of the air carrier fleet. The re-evaluation found that there should be more engineering involvement with the flight standards inspectors in the day-to-day monitoring of the airline. As a result, an additional work element has been added to the continued airworthiness work program. That element consists of establishing a cadre of engineers in every aircraft certification office, whose sole function is to work with the local flight standards offices in their day-to-day interface with the airlines and participate to a greater degree in the formal and informal evaluations and audits of the airlines. Some of the new/increased areas of involvement include: the approval/review of major structural repairs, the approval/review of the engineering aspects of air carrier maintenance programs, and on-site witnessing of major maintenance/repair activity. During these activities there would be an emphasis on the engineering (data approval) activities, but these engineers would not in any way replace or diminish the continued need for flight standards aviation inspector involvement. Significant safety improvements are possible in the system if engineers were to become more directly involved with the airlines in day-to-day operations. The airlines recognize that benefit, and have combined engineering/maintenance teams to address their safety issues.

CIVIL AVIATION SECURITY

3. Civil Aviation Security Staffing: 164 Positions, 89 FTE's and $6,145,000.

An increase of 164 positions, 89 FTE's and $6,145,000 for PC&B is requested for additional Civil Aviation Security special agents and related support staff. Security staffing is based on a staffing standard which identified, documented, and measured duties and responsibilities of field personnel who perform Civil Aviation Security work. Annual increments take into consideration the FAA's ability to appropriately train and effectively assimilate these personnel into the work force.

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

These personnel will facilitate the timely development of critical terrorist threat information through intelligence analyses, in-flight security for U.S. air carriers operating in high threat areas, protection of those traveling in air commerce against criminal and terrorist attack, increased efforts in personnel security relative to hiring of air traffic control specialists, and assurance of the FAA's compliance with requirements pertaining to computer security and the Privacy Act of 1974. They are also vital to the protection of the FAA facilities and personnel and compliance with regulations protecting AUTODIN resources of the Defense Communications System. The additional staff will be directed as follows:

One hundred twenty-eight (128) positions are requested for special agents at regional and overseas security offices. Some of these agents will perform Federal Air Marshal duties, and others will support the increased level of U.S. and foreign airport inspections and assessments, U.S. and foreign air carrier station inspections (including inspection and enforcement activity to ensure compliance with security requirements), review and approval of foreign air carrier security programs, compliance with Part 109 in dealing with indirect air carrier and freight forwarders, air transportation of hazardous materials, cargo security, and implementation of explosives detection security programs such as thermal neutron analysis systems.

Two (2) special agent positions are required in Washington Headquarters to provide liaison and intelligence coordination between the FAA and various other U.S. intelligence agencies and organizations (e.g., Central Intelligence Agency, Department of State, National Security Agency, Drug Enforcement Administration, U.S. Customs Service, and Federal Bureau of Investigation). It is critical that sufficient staff be available to analyze intelligence data and prescribe security measures to counter any threat to aviation and to the traveling public.

Thirty-four (34) administrative and clerical positions are requested to support the current special agent work force, as well as the additional agents requested in fiscal year 1991. This will allow the agents to focus their efforts on operational rather than clerical and administrative functions.

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

FLIGHT PROGRAM AND MANAGEMENT OF AIRCRAFT

4. Flight Procedures Workload Staffing: 4 Positions, 1 FTE and $45,000.

The additional staffing is required as a result of increased workload in instrument flight procedure development activities. New systems such as the Microwave Landing System (MLS), Global Positioning System (GPS), the acceptance of LORAN C for air navigation, and increases in airport runways all contribute to the increased workload. Correction and realignment of magnetic and geographical positioning data due to variation changes result in extensive changes to instrument flight procedures. Correction of changes resulting from magnetic variations have been deferred for higher priority workload for the last 5 years, resulting in a significant backlog of procedure development work. Although LORAN C and GPS procedures do not require locally installed ground equipment, land acquisition, or site preparation they are subject to user demand. There are approximately 6,000 public use airports in the United States and all are candidates for LORAN C and GPS instrument procedures. In FY 1989, the backlog of all types of procedural work units increased by 77 percent. The present backlog includes workload required by NAS capacity plans. These actions lead to revision and development of new enroute procedures and standard instrument procedures.

RECORDS SERVICING AND ANALYSIS

5. Drug Enforcement Assistance Act of 1988: 43 positions, 22 FTE's, and $1,526,000.

A total program level of $3,126,000 is planned for the Airmen and Aircraft Registry Reporting System, of which $1,600,000 will be credited to the appropriation by the collection of users' fees and $1,526,000 ($647,000 for PC&B and $879,000 for contractual support) is requested in direct appropriations.

These resources will permit the FAA to begin to carry out its mandate under the Drug Enforcement Assistance Act which requires a number of basic record-keeping, procedural, and communications changes for the Registry. Increases in resource requirements for airmen/aircraft registration processes are keyed to the establishment of periodic re-registration of all airmen certificates, the complexity of the proposed new airman certificate which will include a laser printed photograph and machine readable capability, and the processing of forms for reporting major alterations and repairs of fuel tanks and fuel systems of aircraft. Registration processes will experience a significant technological leap from labor intensive to a fully automated, compatible system.

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

The FAA is now developing a proposed rule to begin implementation of the changes to the current law. Implementation of the rule is expected as early as October 1, 1990. In the first year (FY 1991) the FAA will begin to phase in the following new procedures:

- Issuance of non-forgeable, accountable airmen certificates with pictures using new sophisticated laser equipment.

- Issuance of all new aircraft registration certificates under proposed requirements, and existing certificates would begin a 3-year schedule for re-registration based on month of original issuance.

- Issuance of all new pilot certificates under proposed requirements and the implementation of a 3-year schedule for reissuance of airmen certificates beginning in FY 1991 with pilots who intend to fly into or out of the country.

- Implementation of revised procedures for handling Aircraft Modification Approval Forms (Form 337) which will provide better response times to law enforcement agencies.

Two key workload elements of the Airmen Registration system are the periodic re-registration of all airmen certificates and the complexity of the proposed new airman certificate. The workload indicators for airmen certification are expected to increase from 798,741 units in FY 1989 to 1,714,796 in FY 1991. The Aircraft Registration system will require the periodic re-registration of all general aviation aircraft and new reporting requirements on major alterations and repairs to aircraft. The workload indicators for aircraft registration are expected to increase from 748,776 units in FY 1989 to 1,119,018 in FY 1991.

MEDICAL

6. Drug Abatement Program: 6 Positions, 3 FTE's and $153,000.

An increase of $153,000 is required for FC&B. The Department's Final Rule of "Procedures for Transportation Workplace Drug Testing Program" dated December 1, 1989 and the Federal Aviation Administration's (FAA) Final Rule on "Anti-Drug Program for Personnel Engaged in Specified Aviation Activities," dated November 21, 1988, established the elements required of the industry's drug abatement program. As a result of these rules the Medical subactivity has been tasked with a comprehensive set of duties and responsibilities. These positions are required to support the increasing workload associated with the drug abatement program and to ensure the effective oversight and administration of the Aviation Industry Drug Program, which affects 15,000 aviation entities and individuals. These two categories involve approximately 500,000 employees.

During FY 1990, contractual support will be initiated for program operations and maintenance, compliance monitoring and evaluation of the industry drug-testing program. The preliminary workload estimates include review, correction and amendment of anti-drug plans, as well as the ongoing requirement for plan submissions from new certificate holders and associated industry components. Plan amendment, monitoring and compliance, and semi-annual and annual reporting and follow-up complete the cycle. These resources will accomplish the development of training, education, and guidance for the FAA regional and central office staff and affected aviation industry personnel, development of software and data management including linkage to the regions, anti-drug plan review, approval, tracking system update and follow-up, development of self-evaluation monitoring methodology and training of affected industry and the FAA staff, compliance auditing, and development and conduct of impact evaluation methodology.

7. Aviation Safety Staffing: 5 positions.

The responsibility for aviation safety oversight was established with the Office of Safety during FY 1989. These additional positions are planned to provide oversight of aviation safety matters by conducting investigations, analyzing trends, evaluating existing and proposed regulations and procedures, and selected programs that relate to the National Airspace System, flight operations, maintenance, aircraft, and technology. The oversight mission includes the following functions:

- Development, coordination and recommendation of policies, regulations technical guidance, procedures, practices, and program plans.

- Development and recommendation of specific program goals and areas of emphasis to guide field program planning and performance.

- Evaluation of the adequacy of existing regulations, policies, procedures, practices, and operational performance in meeting FAA safety goals.

- The monitoring of pertinent statistical data to determine the need for special studies, research, or regulations.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS APPROPRIATION
Development Direction

	Dollar Resources ($000)			Staffing			
					Ceiling FTE		
	PC&B	Other Objects	Total	FTP Pos.	Total	FTP	OTFTP
1. FY 1989 Actual	$9,022	$2,211	$11,233	136	137	136	1
2. FY 1990 Program Level............	11,085	3,836	14,921	140	158	158	0
3. Price Level, Annualization and other non-discretionary changes........................	234	289	523	10	8	8	0
4. Program Reductions (Discretionary)................	(89)	(34)	(123)	0	0	0	0
5. Recommended Program Increases.....	0	0	0	0	0	0	0
6. FY 1991 Request Level............	$11,230	$4,091	$15,321	150	166	166	0

OPERATIONS APPROPRIATION

Development Direction

General Justification

For FY 1991, the Development Direction activity will require $15,321,000; 150 positions; and 166 FTE's. This represents an increase of $400,000; 10 positions; and 8 FTE's over the FY 1990 level.

A major reorganization within the FAA has brought about a positive redirection of the thrust of the Development Direction activity. In addition to providing for the planning, monitoring, and coordinating of the FAA's research, development, engineering, test and evaluation programs (excluding that relating to Aviation Medicine), as in the past, this activity is now providing both the technical and administrative program management associated with the implementation of the Agency's $15.8 billion NAS Plan. This activity also supports efforts associated with NAS modernization. It also provides the resources necessary for the development and promulgation of national aviation policy as such policy relates to environmental and energy matters; and the development and coordination of the overall FAA energy conservation initiatives.

Resource Summary ($000)

		Actual FY 1987	Actual FY 1988	Actual FY 1989	(Est.) FY 1990	Proposed Change	(Est.) FY 1991
Total -	PC&B	$ 8,150	$ 8,226	$ 9,022	$11,085	$ 145	$11,230
	O.O.	1,912	1,261	2,211	3,836	255	4,091
	Total	$10,062	$ 9,487	$11,233	$14,921	$ 400	$15,321

Staffing Information

	Actual FY 1987	Actual FY 1988	Actual FY 1989	(Est.) FY 1990	Proposed Change	(Est.) FY 1991
FTP Positions	138	136	136	140	10	150
Ceiling FTE's	127	127	137	158	8	166
Employment	127	127	148	143	0	143

OPERATIONS APPROPRIATION

Development Direction

The estimate for FY 1991 provides a net increase of $400,000, 10 FTP positions, and 8 FTE's over the FY 1990 level. Changes in requirements for FY 1991 follow:

	($000) Total
Annualization of FY 1990 WIG's	$ 38
New FY 1991 WIG's	35
Merit Pay	34
Inflation	89
Annualization of FY 1990 FTE's	149
Annualization of FY 1990 Pay Raise	86
FY 1991 Pay Raise for GS and SES	149
One Extra Day	43
Retirements	(100)
Subtotal, Price Level, Annualization, and Other	523
Contractual Services	(123)
Subtotal, Program Decreases	(123)
Total Net Increase	$ 400

OPERATIONS APPROPRIATION

Development Direction

Price Level, Annualization and Other Non-discretionary Changes ....10 positions, 8 FTE's, $523,000

1. $38,000 will fund annualization of 42 within-grade increases approved for FY 1990 but effective for only a portion of that year.

2. $35,000 is required for part-year funding of an estimated 40 within-grade increases that will become effective in FY 1991.

3. $34,000 will fund merit pay increases in FY 1991.

4. $89,000 is due to inflation and price level increases for travel, supplies and materials, printing, and other services.

5. $149,000 will fund the annualization of eight FTE's provided in the FY 1990 budget.

6. $86,000 is requested to cover one quarter of the annualized cost of the FY 1990 3.6 percent pay raise.

7. $149,000 is requested to cover one-half of the three-quarter year costs of the FY 1991 3.5 percent pay raise and the Senior Executive Service pay raise. The remaining 50 percent of the cost in FY 1991 is covered by prudent management of other resources. This will entail more effective position controls such as delays in hiring and backfilling vacancies at lower grades, primarily within the non-safety related areas, and through more efficient management of travel and support contracts.

8. $43,000 is an FY 1991 adjustment for the "Extra Day". The FAA Personnel Compensation and Benefits model computes compensation for a 260 day "average" work year. FY 1991 contains 261 compensable work days.

9. A decrease of $100,000 is associated with ten retirements in FY 1991.

10. A restoration of 10 positions to the base is a technical adjustment which aligns positions to reflect actual program requirements.

OPERATIONS APPROPRIATION

Development Direction

Program Reductions (discretionary)...$-123,000

1. A decrease of $34,000 for non-recurring contracts.
2. A savings due to one-time costs incurred in FY 1990 will reduce the base in FY 1991 by $89,000.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS APPROPRIATION
Administration of Airports

	Dollar Resources ($000)			Staffing			
					Ceiling FTE		
	PC&B	Other Objects	Total	FTP Pos.	Total	FTP	OTFTP
1. FY 1989 Actual	$25,592	$8,257	$33,849	472	469	454	15
2. FY 1990 Program Level	27,810	9,906	37,716	521	492	470	22
3. Price Level, Annualization and other non-discretionary changes	1,283	0	1,283	0	0	0	0
4. Program Reductions (Discretionary)	0	(279)	(279)	0	0	0	0
5. Recommended Program Increases	200	0	200	9	5	5	0
6. FY 1991 Request Level	$29,293	$9,627	$38,920	530	497	475	22

OPERATIONS APPROPRIATION

Administration of Airports

General Justification

For FY 1991, the Administration of Airports program will require $38,920,000, 530 FTP positions, and 497 FTE's. The requirement includes a 3% increase of $1,204,000 over the FY 1990 level of $37,716,000.

The Airports program covers the identification, planning, development, capacity enhancement, and safety certification of the Nation's system of public airports to serve the needs of civil aviation in the 50 States and territories.

Principal activities in the Airports program include planning and promoting efforts to enhance airport capacity and reduce delays; participating in safety planning activities for national and international airports with other organizations (including Federal, Military, State, and local agencies); administering grants for the airport improvement program; developing engineering and safety standards; participating in the transfers of Federal land and property for civil aviation use; collecting, processing, and disseminating airport safety data; ensuring that public agencies receiving Federal assistance continue to operate airports for the benefit of the public in accordance with agreements; and certifying the safety of airports.

The proposed level for FY 1991 includes an increase of 9 positions and 5 FTE to accomodate increasing workload in the capacity/planning and environmental areas of the Airports program.

OPERATIONS APPROPRIATION

Administration of Airports

WORKLOAD AND PERFORMANCE INDICATORS

ACTIVITY GROWTH TRENDS - FISCAL YEARS 1988-1991

	VOLUME OF ACTIVITY				Percentage Change		
	1988	1989	1990	1991	88-89	89-90	90-91
Airports in National Plan of Integrated Airport Systems (NPIAS)	3,725	3,745	3,760	3,780	0.5%	0.4%	0.5%
Number of Airport Improvement Program (AIP) Grants Issued	1,251	1,258	1,260	1,300	0.6%	0.2%	3.2%
Grants-in-Aid Obligation Limitation ($ in millions)	$1,269	$1,398	$1,425	$1,500	10.2%	1.9%	5.3%

OPERATIONS APPROPRIATION

Administration of Airports

Resource Summary ($000)

	FY 1987	FY 1988	Actual FY 1989	(Est) FY 1990	Proposed Change	(Est) FY 1991
PC&B	$22,704	$24,086	$25,592	$27,810	$ 1,483	$29,293
O.O.	5,620	7,719	8,257	9,906	(279)	9,627
TOTAL	$28,324	$31,805	$33,849	$37,716	$ 1,204	$38,920

	FY 1987	FY 1988	Actual FY 1989	(Est) FY 1990	Proposed Change	(Est) FY 1991
FTP Positions	472	472	472	521	9	530
Total Direct Ceiling FTE's	453	458	469	492	5	497
End-of-Year Employment	444	448	468	495	9	504

OPERATIONS APPROPRIATION

Administration of Airports

	($000)
Annualization of FY 1990 WIG's	$ 100
New FY 1991 WIG's	100
Annualization of FY 1990 FTE's	303
Merit Pay	55
FY 1990 3.6 Percent Pay Raise Annualization	200
Inflation	279
Extra Day	95
FY 1991 Pay Raise and SES Pay Raise	301
Anticipatory Retirements	-150
Subtotal, Price level, annualization	$1,283
Program Reduction	$ -279
Net Nondiscretionary Increase	$1,004
New regional Capacity and Environmental Full-time positions	200
Total Net Program Increases	$1,204

OPERATIONS APPROPRIATION

Administration of Airports

Price Level, Annualization and Other Nondiscretionary Changes................................$1,283,000

1. $100,000 will fund annualization of 158 within-grade increases approved in FY 1990, but effective for only a portion of the fiscal year.

2. $100,000 is required for part-year funding of 153 within-grade increases for employees who will become eligible during FY 1991.

3. $303,000 will fund annualization of FY 1990 FTE increases.

4. $55,000 will fund merit pay increases in FY 1991 based on part-year employment for positions approved in FY 1990.

5. An increase of $200,000 is requested to cover one quarter of the annualized cost of the FY 1990 3.6 percent pay raise.

6. $279,000 is due to inflationary and price level increases for travel, transportation of things, supplies and materials, printing and reproduction, and other services.

7. $95,000 is an FY 1991 adjustment for an additional compensable work day; FY 1991 contains 261 compensable work days.

8. $301,000 is requested to cover one-half of the three-quarter year costs of the FY 1991 3.5 percent pay raise and the Senior Executive Service pay raise. The remaining 50 percent of the cost in FY 1991 is covered by prudent management of other resources. This will entail more effective position controls such as delays in hiring and backfilling vacancies at lower grades, primarily within the non-safety related areas, and through more efficient management of travel and support contracts.

9. A reduction of $150,000 is proposed for anticipated retirements.

Program Decrease..$ -279,000

1. A savings due to one-time ADP and other equipment purchases incurred in FY 1990, along with reductions in travel and other services, will reduce the base in FY 1991 by $279,000.

OPERATIONS APPROPRIATION

Administration of Airports

Recommended Program Increase..9 positions, 5 FTE's, and $200,000

New Regional Capacity/Planning and Environmental Positions (9 positions, 5 FTE, and $200,000)

Significant increases in workload are projected in the airports regional functional areas of airport capacity and planning, and environmental reviews. Improving the capacity of the nation's system of airports continues to be a critical safety issue, as well as an economic issue. Other attributing factors to the increasing regional workload are due in part to higher program funding levels, new regulations being implemented, and greater program complexity in dealing with the areas of environmental considerations and airport noise/access policy. Congress continues to show great interest in the environmental area and has directed revisions to Part 150 (regulation governing noise). Additional staff are required for revision and update to Part 150. These staffing increases are needed in order to maintain program quality and to insure the accomplishment of delegated and Congressionally mandated functions. Distribution of the 9 positions is 4 for Capacity/Planning and 5 for Environmental.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS APPROPRIATION
Direction, Staff and Supporting Services

	Dollar Resources ($000)			Staffing			
					Ceiling FTE		
	PC&B	Other Objects	Total	FTP Pos.	Total	FTP	OTFTP
1. FY 1989 Actual	$51,657	$58,943	$110,600	946	1,157	1,130	27
2. FY 1990 Program Level	62,860	65,997	128,857	1,166	1,314	1,287	27
3. Price Level, Annualization and other non-discretionary changes	2,237	2,877	5,114	14	48	48	0
4. Program Reductions (Discretionary)	0	(3,010)	(3,010)	0	0	0	0
5. Recommended Program Increases	0	0	0	0	0	0	0
6. FY 1991 Request Level	$65,097	$65,864	$130,961	1,180	1,362	1,335	27

General Justification

For FY 1991, the Direction, Staff and Supporting Services (DS&SS) activity will require $130,961,000, 1,180 FTP Positions, and 1,362 FTE's. This is an increase of $2,104,000 over the FY 1990 level. The DS&SS activity supports all FAA organizations by providing administrative and housekeeping services. Included are costs for administrative payrolls, communications, administrative supplies, and other items at our Oklahoma City, Atlantic City, European, and regional offices. Also, included in this activity is funding for automatic data processing functions and Information Resource Management Plan costs which are located throughout the agency but which can best be managed and funded in Washington.

Included in this activity are regional and center activities for: Direction and Management (64 positions), Public Affairs (31 positions), International Aviation (12 positions), Legal (254 positions), Aviation Policy and Plans (12 positions), Accounting (345 positions), Budget (80 positions), Civil Rights (40 positions), Communications Control (56 positions), Data Systems (188 positions), and Management Systems (98 positions). These regional and center programs are fully funded within the Operations appropriation and provide the direction and staff functions and supporting services necessary for the conduct of agency activities where such services are not otherwise provided.

The largest part of the DS&SS activity is dedicated to providing the agency with management and data systems. These services account for approximately $70 million out of the total DS&SS budget request of $131 million. Included in this amount is $12 million for penalty mail and $13 million for the printing function. The other significant costs in this area are for contractual programming support and computer and software maintenance.

Although the agency has experienced significant growth in the operational activities, DS&SS activities have remained fairly stagnant (notwithstanding transfers from other activities such as 97 Chief Counsel positions transferred in 1990 from Headquarters Administration). As well as supporting an increasing workforce, DS&SS activities have also absorbed new initiatives such as Electronic Time and Attendance Management Systems, program management for the Computer Resource Nucleus (CORN) and Office Automation Technology and Services (OATS) contracts, and an automated Budget Information System.

OPERATIONS APPROPRIATION

Direction, Staff and Supporting Services

Resource Summary ($000)

	(Actual) FY 1987	(Actual) FY 1988	(Actual) FY 1989	(Est.) FY 1990	Proposed Change	(Est.) FY 1991
TOTAL PC&B	$40,282	$46,444	$51,657	$62,860	$2,237	$65,097
O.O.	41,235	45,707	58,943	65,997	-133	65,864
TOTAL	$81,517	$92,151	$110,600	$128,857	$2,104	$130,961

	(Actual) FY 1987	(Actual) FY 1988	(Actual) FY 1989	(Est.) FY 1990	Proposed Change	(Est.) FY 1991
FTP Positions	1,066	913	946	1,166	14	1,180
Total Direct Ceiling FTE	1,052	1,087	1,157	1,314	48	1,362
End-of-Year Employment	1,001	1,040	1,134	1,301	14	1,315

OPERATIONS APPROPRIATION

Direction, Staff and Supporting Services

The estimate for FY 1991 provides a net increase of $2,104,000; 14 positions; and 48 FTE over FY 1990. Changes in requirements from FY 1990 follow:

	Total ($000)
Annualization of FY 1990 WIG's	$308
New FY 1991 WIG's	291
Annualization of FY 1990 Positions (48 FTE)	240
Merit Pay	178
FY 1990 Pay Raise Annualization	560
FY 1991 Pay Raise/SES Pay Raise	820
Inflation	2,347
Anticipatory Retirements	-400
Extra Day	240
Department of State (DOS)	530
Subtotal, Price level, Annualization	$5,114
Program Decrease	(3,010)
Net Non-Discretionary Increase	$2,104

OPERATIONS APPROPRIATION

Direction, Staff and Supporting Services

Price Level, Annualization and Other Nondiscretionary Changes..... 14 positions, 48 FTE, $5,114,000

1. $308,000 will fund annualization of 480 within-grade increases approved in FY 1990 but effective for only a portion of the fiscal year.

2. $291,000 is required for part-year funding of 453 within-grade increases for employees who will become eligible during FY 1991.

3. $240,000 is required to fund 48 FTE based on part-year employment for 104 positions approved in FY 1990.

4. $178,000 will fund 193 merit pay increases in FY 1991.

5. $560,000 is required to cover one quarter of the annualized cost of the FY 1990 3.6 percent pay raise.

6. $820,000 is requested to cover one-half of the three quarter year costs of the FY 1991 3.5 percent pay raise and the Senior Executive Service pay raise. The remaining 50 percent of the cost in FY 1991 is covered by prudent management of other resources. This will entail more effective position controls such as delays in hiring and backfilling vacancies at lower grades, primarily within the non-safety related areas, and through more efficient management of travel and support contracts.

7. $2,347,000 is due to inflationary and price level increases for travel, transportation of things, supplies and materials, printing and reproduction, and other services.

8. A reduction of $400,000 is proposed for anticipated retirements.

9 $240,000 is required to cover 1 additional compensable day in 1991.

10. An increase of $530,000 is necessary for costs of services being provided by the Department of State for FAA's overseas activities. Beginning in FY 1991, DOS will transfer funds to FAA and subsequently require reimbursement for services provided.

11. Restoration of 14 positions to the base is a technical adjustment which aligns positions to reflect actual program requirements.

OPERATIONS APPROPRIATION

Direction, Staff and Supporting Services

Recommended Program Decreases..$3,010,000

Decrease of $3,010,000 is associated with non-recurring costs for permanent change of station costs, rental of ADP equipment, supplies, transportation policy studies, and various contractual support items.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS APPROPRIATION
Human Resource Management

	Dollar Resources ($000)			Staffing			
					Ceiling FTE		
	PC&B	Other Objects	Total	FTP Pos.	Total	FTP	OTFTP
1. FY 1989 Actual....................	$130,991	$102,324	$233,315	1,256	1,437	1,372	65
2. FY 1990 Program Level.............	139,867	150,253	290,120	1,398	1,494	1,429	65
3. Price Level, Annualization and other non discretionary changes.......................	7,535	5,274	12,809	62	61	61	0
4. Program Reductions (Discretionary)................	(32)	(6,811)	(6,843)	0	0	0	0
5. Recommended Program Increases.....	0	0	0	0	0	0	0
6. FY 1991 Request Level.............	$147,370	$148,716	$296,086	1,460	1,555	1,490	65

OPERATIONS APPROPRIATION

Human Resource Management

General Justification

In FY 1991, the Human Resource Management (HRM) function will require $296,086,000, 1,460 FTP positions, and 1,555 FTE's. This represents an net increase of $5,966,000 over the FY 1990 level. The HRM activity supports all FAA organizations by recruiting and training personnel to perform FAA's highly technical and complex job tasks. This activity also administers and develops numerous human resource management initiatives and programs which support a work force of approximately 54,000.

This budget continues the FAA emphasis on human resource management, occupational and managerial training, and programs to develop and adopt improved and modern recruitment and training systems, as described in the agency's major training initiative -- The Flight Plan for Training.

High priority occupational and managerial training and continuing efforts to overhaul and modernize FAA's training programs will require $188,535,000. This is the minimum level of training to meet critical safety employment goals and continue modernizing the nation's airspace system with additional, more complex equipment. The Flight Plan for Training represents a model for education and training. It details the approaches the FAA will take to recruit and screen the best talent, redesign the curricula for all safety-related occupations, infuse training delivery with advanced technology, and establish the management structure and capability needed to make it all work.

Accomplishment of Human Resource Management functions is divided among three subactivities:

Centralized Training (CT) Subactivity

The major elements of this subactivity are a technical training Academy located in Oklahoma City, Oklahoma; a Center for Management Development located in Palm Coast, Florida; and an administrative and technical staff to design, develop, conduct, and administer an integrated training program to assist employees in accomplishing the agency's aviation safety objectives. This subactivity also includes the agency's employee survey program and organizational development activities.

Within this subactivity fall the provision of training for all agency occupational specialties (estimated at 46,237 training enrollments during FY 1991); the development, revision and maintenance of technical and managerial training courses; and the design of new programs of training (as described in the Flight Plan for Training).

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A significant part of this subactivity is FAA's major organizational improvement program which incorporates efforts such as the National Airspace System (NAS) Human Resource Management Plan which will provide for a more systematic integration of human resources into NAS implementation; the employee survey program which provides feedback to supervisors and managers and stimulates collaborative problem solving; and FAA-wide organizational development efforts which provide organizational consultation on a broad range of workplace issues.

Labor, Personnel, and Human Relations (LP&HR) Subactivity

Major elements of the LP&HR subactivity are operation of the agency's consolidated personnel management information system; recruitment systems and operations; staffing analysis; pay and benefits administration; career planning; employee benefits; and management and employee/labor relations. This subactivity administers the Federal Office of Workers' Compensation Program and unemployment compensation program for the benefit of former employees.

A number of significant initiatives, now underway throughout FAA, are aimed at improving the selection and retention of aviation professionals to operate and manage the national aviation system:

- Modular Applicant Testing and Screening (MATES) Automation and streamlined administrative processes are used to significantly reduce the time and effort involved in evaluating prospective employees.
- Supervisory Identification and Development (SIDP) Updated methods for selecting capable, human-relations oriented first level supervisors at FAA facilities.
- Employee Drug Screening Substance-abuse testing of employees who hold critical safety or security-sensitive positions. Fifty percent of approximately 30,000 employees are tested annually.
- Employee Assistance Programs Counseling to employees with personal problems that may affect job performance, with a focus on rehabilitation and abatement.
- Employee Involvement Program Group problem solving and consensus decision-making which lead to improved labor-management relationships and communications skills.

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- Pay System Studies Analysis of occupational and demographic factors which will lead to decisions regarding pay systems for specialized agency personnel.

- Pay Demonstration Program The pay demonstration program is an experimental program designed to test whether monetary incentives will improve FAA's ability to recruit and retain well qualified safety related employees at certain hard to staff facilities.

- SES Candidate Development Program A more reliable predictive method for identifying top managers for the agency and providing targeted development for identified candidates.

Planning, Direction, and Evaluation (PD&E) Subactivity

This subactivity plans, directs and defines human resource program objectives, formulates standards, and evaluates the effectiveness of the agency's human resource management program. The PD&E subactivity includes the Office of the Associate Administrator for Human Resource Management, responsible for policy guidance and oversight of all agency human resource management programs, and associated staff elements which provide administrative and professional evaluation services to programs administered under the Associate Administrator's direction.

Major initiatives and changes proposed for FY 1991 are summarized below:

A. General A major focus of the Human Resource Management budget request for FY 1991 is a sustained program of training for employees at all levels of the organization.

A keystone of the rebuilding since the 1981 controllers strike has been an integrated human resource planning and systems design and implementation. Significant progress has been made through the use of employee involvement and participative management techniques, organizational development programs, improved selection systems, employee surveys and other progressive human resource management systems. Of continuing high priority concern to FAA in FY 1991 is the need to rebuild our training system. This rebuilding is a critical, operational need. FAA has fallen behind in operational and proficiency training of new and on-board staff, they are not keeping pace with the need for skilled maintenance personnel to service new and about-to-be deployed equipment, and training is antiquated and inefficient. During FY 1991 FAA will continue to develop a modern and streamlined program of training for our safety-critical employees and their managers.

Our Centralized Training subactivity includes the provision of training to newly hired and on-board staff ($174,451,000; 683 FTP and 828 FTE) specific training activities incorporated in the Flight

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Plan for Training ($10,873,000; 18 FTP and 67 FTE), and organizational development activities ($3,211,000; 25 FTP and 32 FTE) for a total Centralized Training requirement of $188,535,000, 726 FTP and 927 FTE.

B. Training Program -- In FY 1991, the training program will require $174,451,000, 683 FTP positions, and 828 FTE's. The increase represents $6,363,000 in annualization costs with an offset of $2,822,000 in program decreases.

This program provides on-going and proficiency training to insure that the growing number of aviation safety inspectors, electronics technicians and engineers, and air traffic controllers performing, managing, or supporting critical safety functions for national air space systems are fully proficient on current and incoming systems and modern, successful management techniques.

FAA employment has increased significantly during the past several years creating backlogs of training. Continued implementation of the NAS Plan and increased inspection efforts have combined to produce a substantial increase in the amount of training required by the FAA. This budget requests funds for only those training requirements which FAA operating officials have verified as essential to operational needs and which are supported by the operating units which have to provide the individuals to be trained. A training program funding (Centralized Training portion only, less Organizational Development/Survey Feedback Action and Flight Plan for Training) table follows:

		($000)	
	FY 1989	FY 1990	FY 1991
Air Traffic	$46,500	$52,510	$53,221
Airway Facilities	28,000	34,610	34,356
Aviation Standards	26,900	40,970	42,457
Computer Based Instruction	8,000	11,190	11,596
Program Administration & Other Support	11,115	18,430	19,142
Management/General	8,400	11,600	12,018
Airports/Logistics	1,400	1,600	1,661
TOTAL	$130,315	$170,910	$174,451

Note: The FY 1991 $6,363,000 annualization/non-discretionary increases are offset by $2,822,000 program decreases.

FY 1991 is an important year for follow-on training requirements for the approximately 1,000 new system maintenance technicians that were recruited during the past two years. New hire training, primarily consisting of prerequisite and basic principles courses, produces cumulative follow-on requirements for technical training on specific equipment. Each new hire normally requires training in 2 to 4 prerequisite courses and 4 to 12 system maintenance courses--a program of training that takes up to 4 years to complete.

In addition, by FY 1991 16% of the field maintenance workforce will be eligible to retire. Although some reduced maintenance has resulted from improved technology associated with the new NAS systems, it has not kept pace with the loss of AF technical expertise through attrition. FAA must ensure that replacement hires are appropriately and expeditiously trained to limit the skill gaps resulting from these retirements.

This is occurring at the same time that FAA must meet the continuing requirement to train existing field personnel on sophisticated new equipment coming into the NAS. Approximately 49 new NAS systems requiring AF operation and maintenance will have been added to the NAS between 1985 and 1990 and eighteen new NAS systems are scheduled to be deployed in FY 1991.

During the previous years' expansion of the inspector workforce, first priority was placed on the provision of initial training to the new inspectors. The FY 1991 training program continues this emphasis. Operational training for all aviation safety inspectors will be supported during FY 1991.

The current state of Air Traffic Controller (ATC) training has been well documented and specific multi-year plans for improvement have been developed. Beginning with FY 1990, significant resources have been devoted to the redesign of the ATC training program. The agency's need to support and sustain an on-going training program during the redesign period will continue to require significant resources, including those associated with the 2,412 newly hired Air Traffic Controllers who will enter training during FY 1991.

C. Flight Plan for Training -- In FY 1991, the Flight Plan for Training will require $13,383,000, 59 FTP positions and 61 FTE's. This represents an increase of $3,521,000 for annualization and non-discretionary costs offset by $3,521,000 in program decreases for the training initiative program which is being conducted in both the Centralized Training and Labor, Personnel, and Human Relations subactivities.

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Due to the urgent requirements to train new personnel being added to the work force and to train employees on new equipment being added to the system, resources have not been available for long range planning of either training requirements or systematic analysis of the training program process. Three studies of FAA's training system were completed in FY 1988. These studies and internal agency assessments concluded that a comprehensive and complete overhaul of the training program was needed. The Technical Training Review Group's final report expressed the conclusion:

> Unless the technical training process is drastically revamped, it will not produce the trained air traffic controllers, technicians, inspectors, and other employees required by a modern National Airspace System (NAS).

In response to these findings, FAA designed a multi-year program of remediation, called the Flight Plan for Training. The Flight Plan includes 8 integrated initiatives: Six initiatives are specifically identified with FAA's training system; two initiatives provide personnel systems support. The training system and the selection system are so totally integrated that improvements in training can not be accomplished without strengthening the selection system.

1. The Office of Training and Higher Education (OTHE) -- has been established to provide status, visibility, and focused management to the training program.
2. On the Job (OJT) Training Improvements -- OJT will be streamlined, standardized, and highly focused on quality instruction provided by expertly trained and highly motivated instructors.
3. Curricula Improvements -- Using scientific analysis, the curricula will be redesigned; state-of-the-art training methods and equipment will be used; interactive training technology and advanced simulation will provide training that is effective and well-received by employee-students.
4. FAA Academy: A Center of Excellence -- An infusion of talent, technology, and facilities will place the FAA Academy at the leading edge of advanced training system development and delivery.

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5. Center for Management Development (CMD) -- The mission, curricula, and capabilities of the CMD will be expanded and enhanced to produce top quality, professional managers to meet the demands and challenges of the 1990's and beyond.

6. Academic and Industrial Ties -- Efforts to enhance FAA relationships with industry and academic institutions will continue in FY 1991. FAA will benefit from the professional assistance of training and education professionals through these relationships and also expects to eventually rely on these sources to provide FAA *with already trained employees. These efforts will provide the agency with superior* talent and ultimately reduce the FAA funding requirement for initial training.

7. Recruitment -- This effort is intended to assure a steady flow of highly skilled, well qualified applicants for all safety-related occupations and to target sources for female and minority groups.

   The FY 1991 program continues the Modular Applicant Testing, Examining, and Screening (MATES) system which shortens the time required for the hiring processes from the current 6 to 12 months to less than 60 days and continues support for dedicated recruitment staffs in the agency's regional offices which were funded by the FY 1990 budget.

   An important feature of the recruitment initiative is the assumption of examining authority for Air Traffic Control Specialists, a function traditionally performed by the Office of Personnel Management (OPM). This transfer, which will occur over a 3-year period (FY 1989-1992), is operationally necessary because OPM has been unable to meet FAA's need for extensive testing in remote locations, during nontraditional (i.e., evening) hours, and on weekends. These flexibilities are especially important as FAA redoubles efforts to more efficiently target the recruitment areas and to achieve goals for the employment of women and minorities in numbers approximating their representation in the labor market.

8. Initial Training Program (formerly Air Traffic Controller Screening) -- Currently, newly-hired air traffic controllers are sent to the FAA Academy for 42 days to determine if they possess the qualifications necessary for success in the occupation. While this program has been very effective in identifying individuals with a high

probability of success as a controller, a large number of candidates fail. These failures are costly, both in human terms to the individuals who have wasted a considerable amount of time and effort in their attempt to qualify as air traffic controllers, and in agency financial resources that are lost when candidates must be separated. During FY 1991 we will continue the design and development of a new prehire process that will do a better job of selecting qualified ATC candidates and eliminating those who may subsequently not be able to meet FAA standards.

		($000)	
	FY 1989	FY 1990	FY 1991
Centralized Training			
The Office of Training & Higher Education	$150	$850	$874
On the Job Training Improvements	150	1,164	4,256
Curricula Improvements	2,700	2,833	2,764
FAA Academy: A Center of Excellence	0	0	5
Center for Management Development	0	2,066	2,138
Academic and Industrial Ties	0	3,960	836
Labor, Personnel and Human Relations			
Recruitment	2,500	2,270	2,262
Initial Training Program	0	240	248
TOTAL	$5,500	$13,383	$13,383

Note: The FY 1991 $3,521,000 annualization/non-discretionary increases are offset by $3,521,000 program decreases.

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Human Resource Management

Workload Measures: Centralized Training Subactivity a/

STUDENT WEEKS	Actual 1987	Actual 1988	Actual 1989	Estimate 1990	Estimate 1991	1987 1988	1988 1989	1989 1990	1990 1991
Air Traffic (AT)	40,146	35,021	43,749	46,015	39,750	-13%	25%	5%	-14%
[AT Initial Quals] b/	[28,377]	[22,017]	[32,996]	[26,610]	[25,350]				
Airway Facilities (AF)	20,926	27,527	25,826	47,850	45,435	32%	-6%	85%	-5%
[AF CBI only] b/	[6,887]	[9,131]	[5,381]	[9,260]	[9,260]				
Aviation Standards (AVS)	9,035	9,154	9,681	14,970	14,970	1%	6%	55%	0%
[AVS Flight only] b	[844]	[1,005]	[1,291]	[1,745]	[1,745]				
Airports/Logistics	1,080	1,219	1,760	2,340	2,340	13%	44%	33%	0%
Management and General	9,285	9,019	10,578	16,950	16,950	-3%	17%	60% c/	0%
Total	80,472	81,940	91,594	128,125	119,445	2%	12%	40%	-7%
ENROLLMENTS									
Air Traffic (AT)	7,767	9,056	9,613	9,801	8,464	17%	6%	2%	-14%
[AT Initial Quals] bd/	[5,055]	[5,402]	[6,578]	[5,780]	[5,300]				
Airway Facilities (AF)	6,561	9,212	10,861	15,794	14,990	40%	18%	45%	-5%
[AF CBI only] b/	[2,722]	[3,325]	[4,193]	[5,944]	[5,944]				
Aviation Standards (AVS)	4,488	4,516	4,960	8,233	8,233	1%	10%	66%	0%
[AS Flight only] b/	[665]	[727]	[868]	[1,353]	[1,353]				
Airports/Logistics	930	1,143	1,700	2,100	2,100	23%	49%	24%	0%
Management and General	5,738	6,342	7,404	12,450	12,450	11%	17%	68% c/	0%
Total	25,484	30,269	34,538	48,378	46,237	19%	14%	40%	-4%

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a/ Student workload measures do not fully reflect the annual centralized training subactivity workload. In addition to class conduct, this subactivity is responsible for the development of new training courses; the updating and revision of currently used courses; the procurement, quality control, and adaptation of contractor developed courseware; and the procurement and quality control of contract instructional services.

b/ Non add

c/ Increase reflects reporting of region arranged and conducted training not previously reported. There is not a major increase in the Management and General training program.

d/ Included in the enrollments are 2,412 inputs for FY 1991.

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Human Resource Management

Workload Measures: Labor, Personnel, and Human Relations Subactivity

This subactivity handles all labor, personnel, and human relations improvement activities undertaken by or on behalf of agency employees. The agency's ratio of human resource management specialists is 1 specialist per 72 employees.

Typical workload measures include:

- o Recruit approximately 100 applicants to fill each new air traffic controller position; recruit applicants for aviation safety inspector, airway facilities technician, and other positions; obtain security and medical clearances necessary to hire safety related employees and support personnel.
- o Process 20,500 recruitment, reassignment, promotion, and termination actions for agency personnel.
- o Investigate and resolve employee appeals and grievances; negotiate with recognized labor organizations and administer labor agreements.
- o Initiate and conduct special human resource improvement programs such as employee involvement, employee assistance, supervisory identification and development, performance management and employee awards.
- o Administer the Department's drug testing program, which involves annual random tests for 50 percent of the 30,000 employees in safety-related and critical positions.
- o Maintain a Consolidated Personnel Management Information System (CPMIS) and associated data base to provide information on staffing and training for agency and Department of Transportation staff.

Workload Measures: Planning, Direction, and Evaluation Subactivity

This subactivity performs the planning, overall agency direction, and guidance work necessary to assure that human resources are available to accomplish the agency's mission. Typical workload measures include:

- o Provide overall guidance and direction for the agency's Human Resource Management program, and evaluate its effectiveness.

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- Formulate and execute budgets for the Operations and Facilities and Equipment appropriations for Human Resource Management; develop 5-year planning estimates; recommend annual fiscal allowances for HRM organizations; and conduct program reviews.

Resource Summary ($000)

SUBACTIVITY:	Actual 1988	Actual 1989	Estimate 1990	Proposed Change	Estimate 1991
Centralized Training					
Personnel Compensation & Benefits	35,631	42,173	46,540	5,061	51,601
Other Objects	81,906	89,790	138,811	-1,877	136,934
Total	117,537	131,963	185,351	3,184	188,535
Flight Plan (non-add)		(3,000)	(10,873)	(0)	(10,873)
Labor, Personnel & Human Relations					
Personnel Compensation & Benefits	89,504	87,889	92,281	2,403	94,684
Other Objects	4,472	11,994	10,186	296	10,482
Total	93,976	99,883	102,467	2,699	105,166
Flight Plan (non-add)		(2,500)	(2,510)	(0)	(2,510)
Planning, Direction & Evaluation					
Personnel Compensation & Benefits	827	929	1,046	39	1,085
Other Objects	194	540	1,256	44	1,300
Total	1,021	1,469	2,302	83	2,385
Total					
Personnel Compensation & Benefits	125,962	130,991	139,867	7,503	147,370
Other Objects	86,572	102,324	150,253	-1,537	148,716
Total	212,534	233,315	290,120	5,966	296,086
Flight Plan (non-add)		(5,500)	(13,383)	(0)	(13,383)

OPERATIONS APPROPRIATION

Human Resource Management

STAFFING INFORMATION

	Actual 1988	Actual 1989	Estimate 1990	Proposed Change	Estimate 1991
FTP Positions					
Centralized Training	707	646	664	62	726
Labor, Personnel & Human Relations	486	594	713	0	713
Planning, Direction & Evaluation	16	16	21	0	21
TOTAL	1,209	1,256	1,398	62	1,460
Flight Plan (non-add)			(59)	(0)	(59)
Direct Ceiling FTEs					
Centralized Training	653	845	866	61	927
Labor, Personnel & Human Relations	647	577	611	0	611
Planning Direction & Evaluation	16	15	17	0	17
TOTAL	1,316	1,437	1,494	61	1,555
Flight Plan (non-add)			(20)	(61)	(81)
End-of-Year Employment Information					
Centralized Training	672	838	894	0	894
Labor, Personnel & Human Relations	462	573	576	0	576
Planning Direction & Evaluation	15	15	20	0	20
TOTAL	1,149	1,426	1,490	0	1,490
Flight Plan (non-add)			(56)	(0)	(56)

OPERATIONS APPROPRIATION

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The estimate for FY 1991 provides for an increase of $5,966,000 over FY 1990. Changes in funding for FY 1991 follow:

	Total Change	($000) CT	LP&HR	PD&E
Annualization of FY 1990 WIG's (636)	$ 511	$ 299	$ 207	$ 5
New FY 1991 WIG's (592)	478	267	200	11
Merit Pay (278)	250	144	106	0
Office of Workers' Compensation Program	1,017	0	1,017	0
Inflation	5,275	4,714	524	37
Annualization of FY 1990 Pay Raise	645	390	247	8
New FY 1991 Pay Raise & SES	1,574	951	603	20
Annualization of FY 1990 FTE increases	3,207	3,207	0	0
One Additional Compensable Workday	266	158	104	4
Savings due to Retirements (42)	(414)	(231)	(181)	(2)
Subtotal, price level, annualization, and other	$12,809	$ 9,899	$2,827	$ 83
Subtotal, recommended program decreases	($ 6,843)	($ 6,715)	($ 128)	($ 0)
Subtotal, recommended program increases	$ 0	$ 0	$ 0	$ 0
Total Net Increases	$ 5,966	$ 3,184	$2,699	$ 83

Price Level, Annualization and Other Nondiscretionary changes.....62 Positions, 61 FTE's, and $12,809,449

1. $511,000 in PC&B to fund annualization of 636 within-grade increases approved in FY 1990 but effective for only a portion of the fiscal year.

2. $478,000 in PC&B for part-year funding of 592 within-grade increases for employees who will become eligible during FY 1991.

3. $250,000 in PC&B for 278 merit pay increases in FY 1991. (Estimates for numbers and funding of within-grade and merit pay increases were extracted from the Consolidated Personnel Management Information System (CPMIS).

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4. $1,017,449 in PC&B to fund an increase in the number of claims processed through the Office of Workers' Compensation Program (OWCP). Federal Employees' Compensation payments are billed by the Department of Labor (DOL) 2 years after actual disbursement. The fiscal year 1988 DOL disbursements totaling $63,980,490 will be paid during fiscal year 1990. FAA's payment into the Federal Employees' Compensation fund in fiscal year 1991 for fiscal year 1989 is $64,997,939.

5. $5,275,000 increase in Other Objects funding is due to inflationary and price level increases for travel, transportation of things, supplies and materials, and other services.

6. $645,000 increase is requested to cover 1/4 of the FY 1990 3.6 percent pay raise annualized cost.

7. $1,574,000 is requested to cover one-half of the three-quarter year costs of the FY 1991 3.5 percent pay raise and the Senior Executive Service pay raise. The remaining 50 percent of the cost in FY 1991 is covered by prudent management of other resources. This will entail more effective position controls such as delays in hiring and backfilling vacancies at lower grades, primarily within the non-safety related areas, and through more efficient management of travel and support contracts.

8. $3,207,000 to fund 61 FTE's based on part-year employment approved in FY 1990.

9. $266,000 is an adjustment for 261 compensable workdays in FY 1991 versus 260 in FY 1990.

10. $414,000 decrease is associated with retirements.

11. Restoration of 62 positions is a technical adjustment which aligns positions to actual FTE usage.

Recommended Program Decreases ($6,843,000)

1. A savings due to one-time costs incurred in FY 1990 will reduce the base in FY 1991 by $6,843,000.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS APPROPRIATION
Headquarters Administration

	Dollar Resources ($000)			Staffing			
					Ceiling FTE		
	PC&B	Other Objects	Total	FTP Pos.	Total	FTP	OTFTP
1. FY 1989 Actual	$26,229	$10,108	$36,337	520	511	484	27
2. FY 1990 Program Level	23,542	7,407	30,949	395	402	382	20
3. Price Level, Annualization and other non-discretionary changes	1,019	0	1,019	0	0	0	0
4. Program Reductions (Discretionary)	0	(230)	(230)	0	0	0	0
5. Recommended Program Increases	100	0	100	5	0	0	0
6. FY 1991 Request Level	$24,661	$7,177	$31,838	400	402	382	20

OPERATIONS APPROPRIATION

Headquarters Administration

General Justification

Headquarters Administration will require $31,838,000, 400 positions, and 402 FTE for FY 1991. This represents a 3% increase of $889,000 above the FY 1990 base of $30,949,000, 395 positions, and 402 FTE's.

Headquarters Administration funds the Washington headquarters administrative functions that establish policy and direct and develop programs which provide the following administrative services: Policy and Plans, Accounting, Budget, Civil Rights, International Aviation, Management Systems, and Data Systems. In FY 1990 Headquarters Administration became a subactivity of the Operations Appropriation. Prior to FY 1990, Headquarters Adminstration was a separate appropriation. The merge was intended to streamline the administrative functions in the FAA. Those functions associated with specific programs, e.g., Air Traffic, Aviation Standards, etc., have been moved to their respective subactivities within Operations. These transfers have resulted in noticeable changes in funding levels between FY 1989 and FY 1990.

The proposed level for FY 1991 includes an increase of 5 positions to accomodate continued workload growth in the areas of Accounting and Budget. The Headquarters Administration base program includes $23.5 million to support 395 full-time permanent positions. The other object base includes $1.2 million for travel, $5.5 million for other services, and $.7 million for transportation of things, communications, utilities, supplies, and equipment.

Resource Summary ($000)

	FY 1987	FY 1988	Actual FY 1989	(Est) FY 1990	Proposed Change	FY 1991 Estimate
PC&B	$25,309	$28,186	$26,229	$23,542	$1,119	$24,661
O.O.	9,397	6,656	10,108	7,407	(230)	7,177
Total	$34,706	$34,842	$36,337	$30,949	$ 889	$31,838

* In FY 1990 the associate administrators' offices were transferred to their related programs and the Chief Counsel's office was transferred to Direction, Staff and Supporting Services.

OPERATIONS APPROPRIATION

Headquarters Administration

Staffing Information

	FY 1987	FY 1988	Actual FY 1989	(Est) FY 1990	(Est) Change	FY 1991 Estimate
FTP Positions	507	510	520	395	5	400
Total Direct Ceiling FTE's	521	530	511	402	0	402
End of Year Employment	494	503	454	403	5	408

The estimate for FY 1991 provides an increase of $889,000 above FY 1990. Changes in requirements for FY 1991 follow:

	Total ($000)
Annualization of FY 1990 WIG's	$ 165
New FY 1991 WIG's	148
Merit Pay	110
Inflation	230
FY 1990 Pay Raise Annualization	194
Extra Day	83
FY 1991 Pay Raise and SES Pay Raise	239
Savings from Retirements	-150
Subtotal, Nondiscretionary Increase	$1,019
Program Reduction	-230
Net Nondiscretionary Increase	$ 789
New Accounting and Budget Full-time positions	$ 100
Total Net Program Increase	$ 889

OPERATIONS APPROPRIATION

Headquarters Administration

Price Level, Annualization and Other Nondiscretionary Changes..............................$1,019,000

1. $165,000 will fund annualization of 155 within-grade increases in FY 1990, but effective for only a portion of the fiscal year.
2. $148,000 is required for part-year funding of 182 within-grade increases for employees who will become eligible during FY 1991.
3. $110,000 will fund merit pay increases in FY 1991.
4. $230,000 is due to inflationary and price level increases for travel, transportation of things, supplies and materials, printing and reproduction, and other services.
5. $194,000 is requested to cover one quarter of the annualized cost of the FY 1990 3.6 percent pay raise.
6. $83,000 is an FY 1991 adjustment for an additional compensable work day; FY 1991 contains 261 compensable days.
7. $239,000 is requested to cover one-half of the three-quarter year costs of the FY 1991 3.5 percent pay raise and the Senior Executive Service pay raise. The remaining 50 percent of the cost in FY 1991 is covered by prudent management of other resources. This will entail more effective position controls such as delays in hiring and backfilling vacancies at lower grades, primarily within the non-safety related areas, and through more efficient management of travel and support contracts.
8. A reduction of $150,000 is proposed for anticipated retirements which are projected to be replaced with employees at lower grade levels.

Program Decrease..$ -230,000

1. A savings due to a FY 1990 one-time purchase of ADP and other equipment in FY 1990, along with reductions in travel and other services, will reduce the base in FY 1991 by $230,000.

OPERATIONS APPROPRIATION

Headquarters Administration

Recommended Program Increase..5 positions and $100,000

1. Two positions and $40,000 for personnel compensation and benefits are requested for the Office of Budget to meet increasing workload. The Systems Staff requires one additional position which will be primarily responsible for expanded use and application of the Budget Information System. This system will be part of an agency wide network of real time budget execution and formulation data that will facilitate the budget process, resulting in increased efficiencies agency wide. One additional position is required in the Operations division to provide increased planning, analysis and evaluation of complicated NAS Plan modernization requirements and for planning, analysis, and formulation of budget estimates, the evaluation of program execution, and program transition to operational systems.

2. Three positions and $60,000 for personnel compensation and benefits are requested to perform accounting operations in areas where demand for additional accounting information has produced significantly unmanageable backlogs. Two of these positions are required to perform evaluations of accounting offices per FAA Order 1800.2E, which mandates that the Office of Accounting accomplish these evaluations. One additional position is required to perform accounting operations which have come under increased criticism for not providing timely service in the areas of travel and year-end reporting.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS APPROPRIATION
Management Initiatives

	Dollar Resources ($000)			Staffing			
					Ceiling FTE		
	PC&B	Other Objects	Total	FTP Pos.	Total	FTP	OTFTP
1.FY 1989 Actual	$0	$0	$0	0	0	0	0
2.FY 1990 Program Level	0	0	0	0	0	0	0
3.Price Level, Annualization and other non-discretionary changes	(1,300)	0	(1,300)	0	(200)	(200)	0
4.Program Reductions (Discretionary)	0	0	0	0	0	0	0
5.Recommended Program Increases	0	0	0	0	0	0	0
6.FY 1991 Request Level	(1,300)	0	(1,300)	0	(200)	(200)	0

OPERATIONS APPROPRIATION

Management Initiatives

Background

As part of the Administration's Reform 88 program, OMB has emphasized the use of the performance-based management concepts of A-76 and other efforts to streamline and generally improve the efficiency of government without reducing the quality of services, not only for functions that could be competed with the private sector, but also for the development of more efficient in-house operation of governmental functions. In addition, the divestiture of appropriate functions from Federal control has been encouraged.

As part of the Government A-76 initiative, the FAA directly contracted for many traditional commercial type functions in the late 1970's and early 1980's.

FY-1989 Accomplishments

- A total of 325 positions were reviewed during FY 1989.
- Two A-76 studies were completed.
- One management efficiency study was completed.

Present Program

Our current inventory indicates 1,025 FTE's to be reviewed in the FY 1991 to FY 1993 timeframe.

Other "Privatization Efforts

When reviewing the FAA's overall accomplishments, consideration must be given to the other "privatization efforts" which fall outside the A-76 program. These efforts have resulted in the transfer of numerous functions to the private sector, reduced the role of the Federal government in certain activities, and saved the government millions of dollars. For example:

- FAA continues its direct contract support efforts. In FY 1990 FAA had approximately 9,300 FTE's performing contract support functions. The activities involved range from automated data processing to systems engineering, installation, operation, maintenance and system testing.

OPERATIONS APPROPRIATION

Management Initiatives

- o FAA's "Designee Program" authorizes the Adminisrator to appoint qualified persons to act as his representatives. Eight primary categories of individual designees have expanded to approximately 16,300 support personnel.

These examples are representative of the aggressive approach with which we pursue all opportunities for privatization at FAA, in addition to those available under the A-76 program.

FY 1991 Savings

The FY 1991 budget request includes anticipated savings of 200 FTE's and $1,300,000 related to A-76 studies. None of these anticipatory savings will come from the controller work force or the maintenance of the air traffic control system.

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
MISCELLANEOUS EXPIRED ACCOUNTS

Program and Financing (in thousands of dollars)

Identification code 69-9912-0-1-402	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
10.00 Total obligations (object class 25.0)	......	259	......
Financing:			
17.00 Recovery of prior year obligations.................	-251	......	......
21.40 Unobligated balance available, start of year...............	-8	-259	......
24.40 Unobligated balance available, end of year.................	259	......	......
39.00 Budget Authority...........	......	......	......
Relation of obligations to outlays:			
71.00 Obligations incurred, net....	......	259	......
72.40 Obligation balance, start of year...............	2,255	1,713	......
74.40 Obligation balance, end of year.................	-1,713	......	......
77.00 Adjustments in expired accounts....................	384	......	......
78.00 Adjustments in unexpired accounts....................	-251	......	......
90.00 Outlays...................	674	1,972	......

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

MISCELLANEOUS EXPIRED ACCOUNTS

This schedule displays programs that no longer require appropriations and thus reflect outlays made under prior year appropriations. These programs include Facilities, Engineering and Development and Metropolitan Washington Airports.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

AIRCRAFT PURCHASE LOAN GUARANTEE PROGRAM

The Secretary of Transportation may hereafter issue notes or other obligations to the Secretary of the Treasury, in such forms and denominations, bearing such maturities, and subject to such terms and conditions as the Secretary of the Treasury may prescribe. Such obligations may be issued to pay any necessary expenses required pursuant to any guarantee issued under the Act of September 7, 1957, Public Law 85-307, as amended (49 U.S.C. 1324 note). None of the funds in this Act shall be available for the implementation or execution of programs under this head the obligations for which are in excess of [$10,000,000] $57,000,000 during fiscal year [1990] 1991. Such obligations shall be redeemed by the Secretary from appropriations authorized by this section. The Secretary of the Treasury shall purchase any such obligations, and for such purpose he may use as a public debt transaction the proceeds from the sale of any securities issued under the Second Liberty Bond Act, as now or hereafter in force. The [purpose] purposes for which securities may be issued under such Act are extended to include any purchase of notes or other obligations issued under the subsection. The Secretary of the Treasury may sell any such obligations at such times and price and upon such terms and conditions as he shall determine in his discretion. All purchases, redemptions, and sales of such obligations by such Secretary shall be treated as public debt transactions of the United States.

(Department of Transportation and Related Agencies Appropriations Act, 1990)

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AIRCRAFT PURCHASE LOAN GUARANTEE PROGRAM

Program and Financing (in thousands of dollars)

Identification code 69-1399-0-1-402	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
10.00 Total obligations...........	2,151	148	150
Financing:			
39.00 Budget Authority............	2,151	148	150
Budget Authority:			
40.00 Appropriation (define)......	10,771	...	...
40.00 Appropriation (undefinite)..	1,098	...	...
40.47 Portion applied to debt, reduction.................	-10,771	...	...
43.00 Appropriations (adjusted)...	1,098	...	...
47.00 Authority to borrow (97 stat).................	1,053	150	150
47.00 Reduction pursuant to P.L. 94-177...............	...	-2	...
Relation of obligations to outlays:			
71.00 Obligations incurred, net...	2,151	148	150
72.47 Obligated balance, end of year: Authority to borrow	-16	930	...
74.47 Obligated balance, end of year: Authority to borrow	-930	...	...
90.00 Outlays......................	1,205	1,078	150
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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AIRCRAFT PURCHASE LOAN GUARANTEE PROGRAM
(Status of Direct Loans) (in thousands of dollars)

Identification code 69-1399-0-1-402	19 89 actual	19 90 estimate	19 91 estimate
Cumulative balance of direct loans outstanding:			
1210 Outstanding, start of year..	49,193	49,193	49,193
1290 Outstanding, end of year....	49,193	49,193	49,193
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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AIRCRAFT PURCHASE LOAN GUARANTEE PROGRAM
(Status of Guaranteed Loans) (in thousands of dollars)

Identification code 69-1399-0-1-402	19 89 actual	19 90 estimate	19 91 estimate
Cumulative balance of guaranteed loans outstanding:			
2210 Outstanding, start of year..	115,107	67,379	52,561
2251 Repayments and prepayments..	-47,728	-14,818	-13,790
2290 Outstanding, end of year....	67,379	52,561	38,771
MEMORANDUM			
2299 U.S. contingent liability for for guaranteed loans outstanding, end of year..	60,641	47,305	34,894
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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AIRCRAFT PURCHASE LOAN GUARANTEE PROGRAM

Program and Performance

This program is continuing only for the purpose of making payments to private lenders upon default of existing loans by air carriers. No new loan guarantees are being made.

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AIRCRAFT PURCHASE LOAN GUARANTEE PROGRAM
Program and Financing (in thousands of dollars)

Identification code 69-1399-0-1-402	19 89 actual	19 90 estimate	19 91 estimate
21.0 Travel and transportation of persons..................	15	10	10
25.0 Other services..............	25	28	30
33.0 Investments and loans.......	911	...	...
43.0 Interest and dividends......	1,200	110	110
99.9 Total obligations...........	2,151	148	150
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APLG-6

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

AVIATION INSURANCE REVOLVING FUND

The Secretary of Transportation is hereby authorized to make such expenditures and investments, within the limits of funds available pursuant to section 1306 of the Act of August 23, 1958, as amended (49 U.S.C. 1536), and in accordance with section 104 of the Government Corporation Control Act, as amended (31 U.S.C. 9104), as may be necessary in carrying out the program set forth in the budget for the current fiscal year for aviation insurance activities under said Act.

(Department of Transportation and Related Agencies Appropriations Act, 1990.)

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AVIATION INSURANCE REVOLVING FUND
Program and Financing (in thousands of dollars)

Identification code 69-4120-0-3-402	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
10.00 Total obligations...........	182	163	163
Financing:			
Offsetting collections from:			
11.00 Federal funds...............	-3,807	-3,753	-3,753
14.00 Non-Federal sources.........	-10	-10	-10
Unobligated balance available, start of year:			
21.90 Treasury balance............	-84	-144	-79
21.91 U.S. securities (par value).	-41,760	-45,335	-49,000
Unobligated balance available, end of year:			
24.90 Treasury balance............	144	79	79
24.91 U.S. securities (par value).	45,335	49,000	52,600
39.00 Budget authority............	......	......	......
Relation of obligations to outlays:			
71.00 Obligations incurred, net ..	-3,635	-3,600	-3,600
72.90 Obligated balance, start of year: Fund balance..............	11	13	13
74.90 Obligated balance, end of year: Fund balance..............	-13	-13	-13
90.00 Outlays....................	3,637	-3,600	-3,600
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AIRF-2

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AVIATION INSURANCE REVOLVING FUND

Program and Performance

The fund currently provides direct support for the aviation insurance program authorized under title XIII of the Federal Aviation Act of 1958. Income to the fund is derived from premium deposits for premium insurance coverage issued, income from authorized investments, and binder fees for nonpremium coverage issued. The binders provide aviation insurance coverage for U.S. air carrier aircraft used in connection with certain Government contract operations entered into by the Department of Defense and Department of State.

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AVIATION INSURANCE REVOLVING FUND

Revenue and Expense (in thousands of dollars)

Identification code 69-4120-0-3-402	19 89 actual	19 90 estimate	19 91 estimate
Administrative expenses:			
Revenue......................	3,817	3,763	3,763
Expense......................	182	163	163
Net operating income......	3,635	3,600	3,600

Financial Condition (in thousands of dollars)

	1988 Actual	1989 Actual	1990 Estimate	1991 Estimate
Assets:				
Fund balance with Treasury...........	95	157	92	92
U.S. securities (par)	41,760	45,335	49,000	52,600
Total	41,855	45,492	49,092	52,692
Liabilities:				
Accounts payable	11	13	13	13
Government equity:				
Retained earnings....	41,844	45,479	49,079	52,679

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AVIATION INSURANCE REVOLVING FUND
Object Classification (in thousands of dollars)

Identification code 69-4120-0-3-402	19 89 actual	19 90 estimate	19 91 estimate
11.1 Personnel compensation: Full-time permanent.......	92	94	95
12.1 Civilian personnel benefits.	10	11	11
21.0 Travel and transportation of persons................	2	2	2
25.0 Other services..............	78	2	1
26.0 Supplies and materials......	...	4	4
42.0 Insurance claims and indemnities...............	...	50	50
99.9 Total obligations.........	182	163	163

Personnel Summary

Total number of full-time permanent positions..............	2	2	2
Total compensable workyears: Full-time equivalent employment..	2	2	2

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AIRPORT AND AIRWAY TRUST FUND

Amounts Available for Appropriation (in thousands of dollars)

Identification code 20-8103-0-7-402	19 89 actual	19 90 estimate	19 91 estimate
Unappropriated balance, start of year:			
Treasury balance....................	8,116,120	9,594,677	10,810,178
U.S. Securities: par value..........	8,116,120	9,594,677	10,810,178
Current law:			
Receipts...........................	3,664,465	3,899,900	4,237,000
Interest...........................	1,009,337	1,233,700	1,276,200
Proposed legislation................	....	....	622,600
Total receipts.........................	4,673,802	5,133,600	6,135,800
Total available for appropriation..	12,789,922	14,728,277	16,945,978
Appropriations:			
Facilities and equipment...........	(1,384,184)	(1,746,487)	(2,500,000)
Research, engineering & development	(159,945)	(173,000)	(190,000)
Grants-in-aid for airports:			
Appropriation to liquidate contract authority.........................	(1,150,000)	(1,190,000)	(1,277,000)
Emergency Relief..................	(100)	....	....
Trust fund share of FAA operations.	(471,320)	(816,500)	(2,846,000)
Department of Commerce: NOAA, operations, research & facilities.	(28,717)	(30,000)	(34,521)
Total appropriations...............	(3,194,266)	(3,955,987)	(6,847,521)
Unobligated balance returned to			
Unappropriated receipts.............	(979)	....	....
Reduction pursuant to P.L. 99-177...	....	29,680	....
Reduction pursuant to P.L. 101-164..	....	8,208	....
Unappropriated balance, end of year:			
Treasury balance....................	9,594,677	10,810,178	10,098,457
U.S. Securities:..par value........	9,594.677	10,810,178	10,098,457

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AIRPORT AND AIRWAY TRUST FUND

The Tax Equity and Fiscal Responsibility Act of 1982 (26 U.S.C. 9502), as amended by Title IV of the Airport and Airway Safety and Capacity Expansion Act of 1987 (P.L. 100-223), provides for the receipts received in the Treasury from the 8 percent passenger ticket tax and certain other taxes paid by airport and airway users to be transferred from the general fund of the Treasury to the Airport and Airway Trust Fund. In turn, appropriations are authorized from this fund to meet obligations for airport improvement grants, facilities and equipment, research, and a portion of operations.

The status of the fund is as follows (in thousands of dollars):

	1989 ACTUAL	1990 EST.	1991 EST.
Unexpended balance start of year:			
U.S. Securities (par)...............	11,131,666	12,913,048	14,572,311
Cash.................................	(11,493)	24,473	10,000
Balance of fund, start of year....	11,120,173	12,937,521	14,582,311
Cash income during the year:			
Government receipts:			
From excise taxes:			
Passenger ticket tax..............	3,201,447	3,387,000	3,643,100
Waybill tax.......................	180,645	189,500	199,200
Fuel tax..........................	628,597	106,300	110,100
International departure tax.......	105,818	224,100	291,600
Proposed legislation:			
Passenger ticket tax...............	....	....	573,900
Waybill tax........................	....	....	30,800
Fuel tax...........................	....	....	17,900
Refund of taxes....................	(452,042)	(7,000)	(7,000)
Intrabudgetary transaction:			
Interest on investments...........	1,009,337	1,233,700	1,276,200
Total annual income..............	4,673,802	5,133,600	6,135,800

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
AIRPORT AND AIRWAY TRUST FUND

	1989 ACTUAL	1990 EST.	1991 EST.
Cash outlays during the year:			
Federal Aviation Administration:			
Grants-in-aid for airports.........	1,134,615	1,284,200	1,386,400
Facilities and equipment...........	1,088,106	1,188,400	1,579,200
Research, engineering & development	127,562	179,441	200,973
Operations.........................	477,454	807,185	2,846,000
Department of Commerce: NOAA.......	28,717	29,584	34,521
Total annual outlays.............	2,856,454	3,488,810	6,047,094
Unexpended balance, end of year:			
U.S. Securities (par)...............	12,913,048	14,572,311	14,661,017
Treasury balance....................	24,473	10,000	10,000
Balance of fund, end of year.....	12,937,521	14,582,311	14,671,017
Commitments against unexpended balances:			
Appropriated but not expended......	(3,342,844)	(3,772,133)	(4,572,560)
Committed to future appropriations to liquidate outstanding obligations (contract authority)..............	(1,982,575)	(2,217,575)	(2,440,575)
Unobligated balance of contract authority.........................	(742,587)	(968,787)	(1,268,787)
Uncommitted cash balance, end of year.	6,869,515	7,623,816	6,389,095

At the end of 1990, the uncommitted Trust Fund balance is estimated to be $7.6 billion. This balance has accumulated because a penalty provision in the 1982 and 1987 authorization acts caused the share of FAA operations appropriations financed from the trust fund to be $6.6 billion lower than authorized. This shortfall was subsidized by the general taxpayer through the use of general fund appropriations. Interest of about $2.1 billion has accrued to the trust fund based on the $6.6 billion unused for operations. The total of the unused funds and the interest ($8.7 billion) will exceed the uncommitted balance at the end of 1990.

The authorization for FAA Research, Engineering and Development and Facilities and Equipment programs expires October 1, 1990. Also, user taxes, which support the trust fund, expire at the end of 1990.

The proposed reauthorization legislation accompanying the 1991 budget provides for an increase in the passenger ticket tax from 8 to 10 percent, with proportionate increases in other taxes, and is consistent with cost allocation studies by the FAA, that 85 percent of FAA's budget be financed from the trust fund.

DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

GRANTS-IN-AID FOR AIRPORTS
(LIQUIDATION OF CONTRACT AUTHORIZATION)
(AIRPORT AND AIRWAY TRUST FUND)

For liquidation of obligations incurred for airport planning and development under section 14 of Public Law 91-258, as amended, and under other law authorizing such obligations, and obligations for noise compatibility planning and programs, [$1,190,000,000] $*1,277,000,000*, to be derived from the Airport and Airway Trust Fund and to remain available until expended: *Provided*, That of programs the commitments for which are in excess of [$1,500,000,000] in fiscal year [1990] *1991* for grants-in-aid for airport planning and development, and noise compatibility planning and programs, notwithstanding section 506(e)(4) of the Airport and Airway Improvement Act of [: *Provided further*, That of the amount available for obligation under this head, $100,000,000 shall be made available, in addition to amounts other-wise provided by law, for the planning and execution of programs under section 507-(C)(2) of the Airport and Airway Improvement Act of 1982 as amended]. (*Department of Transportation and Related Agencies Appropriations Act, 1990*).

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
GRANTS-IN-AID FOR AIRPORTS (AIRPORT AND AIRWAY TRUST FUND)
Program and Financing (in thousands of dollars)

Identification code 69-8106-0-7-402	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
10.00 Total obligations (object class 41)	1,397,872	1,425,000	1,500,000
Financing:			
17.00 Recovery of prior year obligations	-30,754	....	....
21.49 Unobligated balance available, start of year: Contract authority	-509,605	-742,587	-968,787
24.49 Unobligated balance available, end of year: Contract authority	742,587	968,787	1,268,787
25.00 Unobligated balance lapsing	....	....	....
39.00 Budget Authority	1,600,100	1,651,200	1,800,000
Budget authority:			
Current:			
40.00 Appropriation	1,150,100	1,190,000	1,277,000
40.49 Portion applied to liquidate contract authority	-1,150,000	-1,190,000	-1,277,000
43.00 Appropriation (adjusted)	100	....	....
Reduction in contract authority:			
49.00 Pursuant to P.L. 101-164	....	-25,000	....
49.00 Pursuant to P.L. 99-177	....	-23,800	....
49.10 Pursuant to P.L. 100-457	-100,000	....	....
Permanent:			
69.10 Contract authority (P.L. 100-223)	1,700,000	1,700,000	1,800,000
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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
GRANTS-IN-AID FOR AIRPORTS (AIRPORT AND AIRWAY TRUST FUND)
Program and Financing (in thousands of dollars)

Identification code 69-8106-0-7-402	19 89 actual	19 90 estimate	19 91 estimate
Relation of obligations to outlays:			
71.00 Obligations incurred, net ...	1,397,872	1,425,000	1,500,000
Obligated balance, start of year:			
72.40 Appropriation	327,094	342,579	248,379
72.49 Contract authority	1,765,557	1,982,575	2,217,575
Obligated balance, end of year:			
74.40 Appropriation	- 342,579	- 248,379	-138,979
74.49 Contract authority	-1,982,575	-2,217,575	-2,440,575
78.00 Adjustments in unexpired accounts..................	-30,754	....	....
90.00 Outlays	1,134,615	1,284,200	1,386,400
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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
GRANTS-IN-AID FOR AIRPORTS (AIRPORT AND AIRWAY TRUST FUND)
Status of Unfunded Contract Authority (in thousands of dollars)

Identification code 69-8106-0-7-402	1989 actual	1990 estimate	1991 estimate
Unfunded balance, start of year ...	2,275,163	2,725,163	3,186,363
Contract Authority	1,700,000	1,700,000	1,800,000
Reduction in contract authority:			
Pursuant to P.L. 99-177..........	....	-23,800	....
Purusant to P.L. 101-164.........	....	-25,000	....
Pursuant to P.L. 100-457.........	-100,000	....	....
Appropriation to liquidate contract authority........................	-1,150,000	-1,190,000	-1,277,000
Unfunded balance, end of year	2,725,163	3,186,363	3,709,363
(Memo cnt: 21.8)	(Memo cnt: 8)	(Memo cnt: 8)	(Memo cnt: 4.8)

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
GRANTS-IN-AID FOR AIRPORTS

Program and Performance

The Airport and Airway Safety and Capacity Expansion Act of 1987, Public Law 100-223, provides for airport improvement grants which emphasize capacity development, safety, and security needs. To meet these objectives, a $1,500,000,000 program level is proposed for fiscal year 1991.

FEDERAL AVIATION ADMINISTRATION
SUMMARY STATEMENT
GRANTS-IN-AID FOR AIRPORTS (AIRPORT AND AIRWAY TRUST FUND)

An obligation limitation of $1,500 million is requested for the airport grant program in FY 1991 for planning and development of the Nation's airports.

Major Objectives:

- Provide grants which are needed to meet airport safety and security regulations or necessary to enhance airport safety and security.
- Provide assistance for high priority projects that meet critical, new, and existing capacity needs of the airport system.
- Fund high priority planning requests that will contribute to airport safety, security, or capacity.
- Fund high priority grant requests for reliever airports, noise compatibility projects, and other projects to meet national goals and objectives.

Federal Role:

Although Federal aid has long been available to assist communities in developing airports, development at the larger airports is funded primarily by airport fees, revenue bonds, State and local assistance, and private initiatives.* Federal funding has generally accounted for about 33 percent of all airport investments and is intended to be used as supplements to funding from other sources. State and local authorities generally pay for terminals, parking structures, etc. The Federal Government funds construction of runways, planning and development of the Nation's airports, and other improvements such as noise control, lighting, and weather equipment. Many of the largest airports have significant potential earnings that could be and are used toward their capital investments such as building hangars for the carriers.

* Smaller airports generally rely more heavily, on Federal grant funds.

GRANTS-IN-AID FOR AIRPORTS

The grant program authorization is in effect through FY 1992 and is proposed for extension through FY 1995. Within the current legislated program structure, formula (entitlement) grants are available to primary airports for eligible development and to States for work at general aviation airports. In addition, discretionary grants are available for specific legislated minimum funding for capacity, security and safety work, reliever airports, small commercial airports, noise compatibility projects, and airport system planning.

The Federal objective is to enhance the national system through increasing safety and security, reducing system delays, and providing new capacity to meet anticipated demands. Factors that are considered include national priorities, cost-effectiveness, and local initiatives. We propose, in authorizing legislation, to continue the additional $100 million allocation of discretionary funds, as authorized in FY 1990. The $100 million allocation for capacity, safety, and security projects allows for more effective overall use of AIP funds.

Our request for increased funding reflects the continued demand for capacity as well as other important projects. In that regard, we are evaluating proposals in the context of reauthorization that would increase airport development through greater use of local funds. If the prohibition on levying passenger facility charges (PFC) were removed as we propose, more than $1 billion could be generated each year, providing a stable source of additional revenues for airport development.

Funding Priority:

Funding for safety and security projects required by regulation and for other safety related development (including reconstruction and bringing airports up to standards) receive highest priority. Capacity improvements also receive high priority. The most critical needs in this area are to alleviate current delays and to provide capacity improvements needed to meet traffic projections at the major hub airports. New airport development is supported where needed and feasible, with priority given to areas with high activity levels.

To help ensure that capacity needs are met, the discretionary portion of the program is proposed to be significantly increased to more effectively target funds to those projects that increase capacity. In addition to the discretionary funds, primary airports may direct formula funds to capacity improvements. Noise planning and implementation of noise compatibility studies receive priority within a specific legislated minimum. Funds for master planning are provided for high activity locations that benefit from such a study, and airport system planning is funded in accordance with the legislated minimum.

GRANTS-IN-AID FOR AIRPORTS

Accomplishments:

1. General Overview.

The availability of grant funds to meet growing needs and increasing costs of airport development has helped the Nation to achieve a safe and efficient airport system. This system is essential to commerce and supports the national defense.

In addition to Federal grants through the AIP, improvements to the system are also financed by other sources such as airport revenues, State and local aid, and airline investments in facilities. In fact, these non-Federal sources provide the majority of financing for airport improvement projects, particularly for larger airports. Funding from all these sources has resulted in an airport system that provides a high level of service in the busiest air commerce system in the world.

2. FY 1989 Planning and Development Activity.

In FY 1989, AIP obligations amounted to $1,397.9 million of which $1,279.3 million were for 1,258 new grant agreements and $118.6 million for increases in existing grant agreements.

The new grants included 512 for a total of $880.9 million for primary airports, 74 for $43.3 million for other commercial service airports, 163 for $169.5 million for reliever airports, 451 for $177.5 million for general aviation airports, and 58 for $8.1 million for integrated airport system planning. Also included, by special direction from Congress, was $16.5 million for installation of instrument landing systems at six airports. A grant for $60 million was issued for the new Denver airport.

Included in these grant agreements (1,258 for $1,279.3 million) was $148.2 million for 69 grants to achieve noise compatibility. This amount includes $84.0 million for the purchase of noise impacted land adjacent to airports, $2.6 million for studies to evaluate and develop noise compatibility programs, $40.3 million for soundproofing residences and schools, and $21.3 million for other efforts to reduce noise.

3. Fund Distribution by Work Increment.

The following shows the distribution of funds by type of work. This indicates that 57 percent ($4,407.0 million) of FY 1982-1989 funds have been directed to landing area construction. Land for both development and noise protection has received the next greatest share and accounts for 16 percent ($1,214.9 million). This table also shows that 42 percent of the funds were discretionary. This includes funds to meet the reliever, commercial service (non-primary), noise, and system planning legislative minimums as well as "pure" discretionary.

Airport Improvement Program
Federal Funds Allocated by Work Increment
FY 1982 - FY 1989
($ Obligations in Millions)

	Discretionary Funds	Formula Funds	Total Funds
1. Planning	$ 122.4	$ 51.5	$173.9
2. Safety and Security (Required by Reg.)	77.9	179.5	257.4
3. Landing Area Construction (Includes Noise Work)			
Runways	832.5	963.3	1,795.8
Taxiways	573.1	803.9	1,377.0
Aprons	459.4	774.8	1,234.2
Subtotal	$1,865.0	$2,542.0	$4,407.0
4. Noise Control (Excluding Landing Area)			
Land	302.2	205.3	507.5
Other	98.0	54.3	152.3
Subtotal	$400.2	$259.6	$659.8
5. Lighting, Navaids, Weather Equipment	188.6	282.3	470.9
6. Building			
Terminal	10.9	293.1	304.0
Other	8.1	52.9	61.0
Subtotal	$19.0	$346.0	$365.0
7. Land (Other Than Noise)	393.9	313.5	707.4
8. Roadways	74.1	380.5	454.6
9. Miscellaneous	92.0	130.5	222.5
Total	$3,233.1	$4,485.4	$7,718.5 *

* Includes carryover of prior year unobligated balances

4. Fund Distribution by Airport Type.

Most of the grant funds are provided to the busier commercial service airports. The primary airports receive more than half of all funds by legislative formula. With the addition of discretionary funds, the primary airports received 66.4 percent of the funds made available since FY 1982. The remainder of the airports, which serve general aviation predominantly, received 33.6 percent of the funds.

Airport Improvement Program
Federal Funds Allocated by Airport Type
FY 1982 - FY 1989
($ in Millions)

Type of Airport	Number of Grants	Obligations Federal Funds	Percent of Funds
Primary	3,055	$5,129.3	66.4
Other Commercial Service	982	441.2	5.7
Reliever	1,099	901.2	11.7
General Aviation	3,220	1,194.9	15.5
System Planning	384	51.9	.7
Total	8,740	$7,718.5	100.0

5. Other Information.

The following three tables represent the FY 1990-FY 1997 LOI program, an AIP split between formula and discretionary grants for FY 1989-FY 1991, and a summary of estimated outlay and liquidating cash levels:

Letter of Intent (LOI).
Fiscal year 1989 was the second year the FAA issued letters of intent (LOI). A total of $64 million was obligated for LOIs in FY 1989. The FAA may issue LOI's for major capacity enhancement projects at primary commercial service or reliever airports. Under an LOI, the airport operator may proceed with a project without Federal funds and receive reimbursement in future years as funds become available. The following is a table of LOI commitments to date which express the intention to reimburse airport operators a total of $347.1 million from FY 1990 through FY 1997, subject to fund availability.

LOI COMMITMENTS BY FISCAL YEAR
($ in Thousands)

LOCATION	1989	1990	1991	1992	1993	1994	1995	1996	1997	TOTAL
Indianapolis Intl	7,000.0	0.0	4,000.0	3,860.0	0.0	0.0	0.0	0.0	0.0	7,860.0
Nashville Metropolitan	9,505.7	2,850.0	5,850.0	5,194.3	0.0	0.0	0.0	0.0	0.0	13,894.3
Greater Cincinnati	4,056.3	11,155.0	7,155.0	6,253.8	0.0	0.0	0.0	0.0	0.0	24,563.8
Austin (New)	15,000.0	5,000.0	13,500.0	13,500.0	10,000.0	10,000.0	10,000.0	5,000.0	5,000.0	72,000.0
Orlando Intl	5,083.0	2,807.0	10,496.0	10,494.0	0.0	0.0	0.0	0.0	0.0	23,797.0
John Wayne/Orange Co	3,750.0	0.0	3,250.0	3,191.5	0.0	0.0	0.0	0.0	0.0	6,441.5
Dallas/Ft Worth	0.0	12,500.0	12,500.0	12,500.0	12,500.0	12,500.0	12,500.0	12,500.0	12,500.0	100,000.0
Las Vegas Intl	6,000.0	6,500.0	6,500.0	10,500.0	4,000.0	4,000.0	4,500.0	0.0	0.0	36,000.0
Kansas City Intl	0.0	5,045.9	6,653.6	6,653.6	2,000.0	2,000.0	0.0	0.0	0.0	22,353.1
Peachtree City	2,126.7	2,126.7	2,126.7	0.0	0.0	0.0	0.0	0.0	0.0	4,253.4
Henry Co/Bear Creek	1,500.0	1,500.0	1,613.7	0.0	0.0	0.0	0.0	0.0	0.0	3,113.7
DuPage Co	10,000.0	9,000.0	9,000.0	9,000.0	0.0	0.0	0.0	0.0	0.0	27,000.0
Stewart Intl	0.0	3,000.0	2,821.7	0.0	0.0	0.0	0.0	0.0	0.0	5,821.7
TOTAL	64,001.7	61,484.6	85,466.7	81,147.2	28,500.0	28,500.0	27,000.0	17,500.0	17,500.0	347,098.5

AIRPORT IMPROVEMENT PROGRAM
PROGRAM LEVEL SUMMARY ($000)

	FY 1989	FY 1990	FY 1991
FORMULA GRANTS			
Primary Airports	586.1	605.9	610.0
Cargo Service Airports	45.0	39.8	42.0
Alaska (Section 507(b)(5))	7.4	10.3	10.3
States (General Aviation)	155.1	159.0	168.0
Subtotal Formula Grants	793.6	815.0	830.3
DISCRETIONARY GRANTS			
Noise Compatibility	145.1	132.5	140.0
Reliever Airports	154.1	132.5	140.0
Small Commercial Airports	38.6	33.1	35.0
System Planning	8.3	6.6	7.0
Set-aside for Capacity	0.0	100.0	100.0
Capacity/Safety and Security/Noise	171.3	34.6	95.8
Carryover (from Formula Grants)	0.0	159.2	120.0
Other Discretionary	89.0	11.5	31.9
Subtotal Discretionary Grants	606.4	610.0	669.7
OBLIGATION LIMITATION	1,400.0	1,425.0	1,500.0

GRANTS-IN-AID FOR AIRPORTS

FEDERAL AVIATION ADMINISTRATION
Summary of Appropriation Requirements
Outlays and Liquidating Cash (L.C.)
($ 000's)

Unexpended Appropriation Balance, 9/30/88	327,094
FY 1989 L.C. Appropriation	1,150,000
FY 1989 Outlays	(1,134,562)
Unexpended Appropriation Balance, 9/30/89	342,532
FY 1990 L.C. Appropriation	1,190,000
FY 1990 Outlays of Contract Authority (est.)	(1,284,153)
Est. Unexpended Appropriation Balance, 9/30/90	248,379
Req. FY 1991 L.C. Appropriation	1,277,000
FY 1991 Outlays of Contract Authority (est.)	(1,386,400)
Est. Unexpended Appropriation Balance, 9/30/91	138,979

Liquidation of Contract Authority

A cash appropriation of $1,277,000 is requested for FY 1991 to liquidate obligations incurred under grants issued for airport planning and development projects and noise compatibility planning and programs.

DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

FACILITIES AND EQUIPMENT (AIRPORT AND AIRWAY TRUST FUND)

For necessary expenses, not otherwise provided for, for acquisition, establishment, and improvement by contract or purchase, and hire of air navigation and experimental facilities as authorized by the Federal Aviation Act of 1958, as amended (49 U.S.C. App. 1301 et seq.), including initial acquisition of necessary sites by lease or grant; engineering and service testing including construction of test facilities and acquisition of necessary sites by lease or grant; and construction and furnishing of quarters and related accommodations of officers and employees of the Federal Aviation Administration stationed at remote localities where such accommodations are not available; and the lease or purchase of one aircraft from funds available under this head, [or prior year funds available under this head, or a combination thereof;] to be derived from the Airport and Airway Trust Fund and to remain available until September 30, [1994, $1,746,487,000] 1995, $2,500,000,000. Provided, That there may be credited to this appropriation funds received from States, counties, municipalities, other public authorities, and private sources, for expenses incurred in the establishment and modernization of air navigation facilities [: Provided further, That none of the funds under this head shall be available for the Secretary of Transportation to enter into grant agreements with universities or colleges for any capital project the Federal share of which is in excess of 50 per centum of the total cost of such project]. (Department of Transportation and Related Agencies Appropriations Act, 1990; additional authorizing legislation to be proposed.)

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
FACILITIES AND EQUIPMENT (AIRPORT AND AIRWAY TRUST FUND)
Program and Financing (in thousands of dollars)

Identification code 69-8107-0-7-402	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
Direct program:			
00.01 Air traffic control centers.....	574,858	773,219	1,110,373
00.02 Airport traffic control towers..	362,195	533,742	680,687
00.03 Flight service facilities.......	62,678	43,552	48,801
00.04 Air navigation facilities.......	83,343	132,411	148,368
00.05 Housing, Utilities, and miscellaneous facilities.......	237,102	186,433	337,301
00.06 Aircraft and related equipment..	7,964	38,707	43,372
00.07 Development, test and evaluation facilities..........	15,540	18,561	20,798
00.08 Personnel compensation, benefits and travel............	......	73,375	127,300
00.91 Total direct program	1,343,680	1,800,000	2,517,000
01.01 Reimbursable program	49,956	70,853	78,637
10.00 Total obligations	1,393,636	1,870,853	2,595,637
Financing:			
Offsetting collections from:			
11.00 Federal funds	-18,294	-26,161	-28,777
14.00 Non-Federal sources	-31,662	-45,327	-49,860
21.40 Unobligated balance available, start of year	-1,320,057	-1,354,285	-1,275,456
22.40 Unobligated balance transferred, net	5,600	......	......
24.40 Unobligated balance available, end of year	1,354,285	1,275,456	1,258,456
25.00 Unobligated balance lapsing.....	676	......	......
27.00 Reduction pursuant to P.L. 99-177........................	......	635	......
39.00 Budget Authority................	1,384,184	1,721,171	2,500,000

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
FACILITIES AND EQUIPMENT (AIRPORT AND AIRWAY TRUST FUND)
Financing and Outlays (in thousands of dollars)

Identification code 69-8107-0-7-402	19 89 actual	19 90 estimate	19 91 estimate
Budget Authority:			
40.00 Appropriation	1,384,184	1,746,487	2,500,000
40.00 Reduction pursuant to P.L. 101-164..................	......	-5,239	......
40.00 Reduction pursuant to P.L. 99-177.........................	......	-20,077	......
43.00 Appropriation (adjusted).....	1,384,184	1,721,171	2,500,000
Relation of obligations to outlays:			
71.00 Obligations incurred, net	1,343,680	1,799,365	2,517,000
72.40 Obligated balance, start of year	1,239,340	1,497,121	2,108,086
74.40 Obligated balance, end of year	-1,497,121	-2,108,086	-3,045,886
77.00 Adjustments in expired accounts.....................	2,207	......	......
90.00 Outlays	1,088,106	1,188,400	1,579,200
(Memo meas. 21.1)	(Memo meas. 8)	(Memo meas. 8)	(Memo meas. 4.8)

FACILITIES AND EQUIPMENT (AIRPORT AND AIRWAY TRUST FUND)

PROGRAM AND PERFORMANCE

Under this appropriation, the Federal airway system is improved by the installation of new equipment and the construction and modernization of facilities to keep pace with expanding aeronautical activity. The appropriation also finances major capital investments required by other agency programs, such as aircraft for flight inspection of facilities, and related training, and experimental facilities for the research, engineering and development program. The operating costs of facilities and equipment procured under this appropriation are financed under the Operations appropriation.

The funding requested for 1991 is in accordance with the Federal Aviation Administration's comprehensive plan for modernizing and improving air traffic control and airway facilities services. The funds requested will support these on-going efforts at a time when nearly 100 percent of all modernization projects are under contract. In addition, funds are requested for improvements to facilities and equipment supporting operations at the Dallas/Ft. Worth, Los Angeles, and new Denver airports.

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
FACILITIES AND EQUIPMENT (AIRPORT AND AIRWAY TRUST FUND)
Object Classification (in thousands of dollars)

Identification code 69-8107-0-7-402	19 89 actual	19 90 estimate	19 91 estimate
Direct obligations:			
Personnel compensation:			
11.1 Full-time permanent	45,559	42,119	53,010
11.3 Other than full-time permanent ..	351	328	392
11.5 Other personnel compensation	3,322	3,645	4,420
11.8 Special personal services payments	59	41	52
11.9 Total personnel compensation ...	49,291	46,133	57,874
Personnel benefits:			
12.1 Civilian	9,518	8,787	11,038
21.0 Travel and transportation of persons	20,097	18,455	23,081
22.0 Transportation of things	1,923	2,510	2,867
23.2 Rental payments to others	5,780	7,545	8,616
23.3 Communications, utilities, and other rent	5,642	7,365	8,411
24.0 Printing and reproduction	387	505	577
25.0 Other Services	600,119	833,420	1,194,663
26.0 Supplies and materials	26,754	34,924	39,883
31.0 Equipment	499,057	684,455	991,959
32.0 Lands and Structures	119,389	155,847	177,977
41.0 Grants, subsidies, and contributions..................	5,669	......	......
42.0 Insurance claims and indemnities	54	54	54
99.0 Subtotal, direct obligations ...	1,343,680	1,800,000	2,517,000
99.0 Reimbursable obligations	49,956	70,853	78,637
99.9 Total obligations	1,393,636	1,870,853	2,595,637
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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
FACILITIES AND EQUIPMENT (AIRPORT AND AIRWAY TRUST FUND)
Personnel Summary

Identification code 69-8107-0-7-402	19 89 actual	19 90 estimate	19 91 estimate
Direct:			
Total number of full-time permanent positions	1,162	1,368	1,743
Total compensable workyears:			
Full-time equivalent employment	1,302	1,326	1,514
Full-time equivalent of overtime and holiday hours	82	97	116
Reimbursable:			
Total number of full-time permanent positions	55	53	55
Total compensable workyears:			
Full-time equivalent employment	54	53	55
Full-time equivalent of overtime and holiday hours	3	4	5

FEDERAL AVIATION ADMINISTRATION
FACILITIES AND EQUIPMENT (AIRPORT AND AIRWAY TRUST FUND)

Budget Activity	Budget Authority
Air Route Traffic Control Centers	$1,050,051,800
Airport Traffic Control Towers	699,350,000
Flight Service Facilities	83,801,000
Air Navigation Facilities	179,371,000
Housing, Utilities, and Miscellaneous Facilities	316,373,200
Aircraft and Related Equipment	29,885,000
Development, Test, and Evaluation	16,270,000
Personnel and Related Expenses	124,898,000
Total, 1991 Estimate	$2,500,000,000

General Justification

The funding request for fiscal year 1991 is in accordance with the Federal Aviation Administration's comprehensive plan for modernizing and improving air traffic control and airway facilities services. Also included are other capital needs that are in addition to the NAS Plan baseline programs.

The National Airspace System (NAS) Plan addresses the compelling problems of how best to accommodate strong demand for aviation services, constrain costs, recast the required technical framework, and deal with aging facilities. It delineates specific improvements to facilities and equipment. Particular emphasis focuses on en route and terminal air traffic control.

Despite its high level of safety, the National Airspace System is not without its problems. The major problem is how to expand the capacity of the airport and air traffic systems to provide more direct routings and accommodate the rate, sequence, and speed at which aircraft move through the system.

Forecasts indicate that demand for aviation services will grow significantly over the next decade. The table on page 9 summarizes our forecasts. The capacity enhancing projects of the NAS Plan are essential to provide for this growth. Growth in aviation activity is only one part of the issue. An equally compelling issue is that the current system of FAA facilities is rapidly aging and the maintenance and operational costs are rising. We must continue to implement the plan in accordance with the plan schedule so that necessary economies may be realized as soon as possible.

The recurrent theme throughout the plan is that safety, capacity, productivity, and economy will be chiefly realized through higher levels of automation, consolidation of major facilities, and by the application of rapidly changing and lower cost technologies in telecommunications.

The Agency's primary goal is to provide for the safe and efficient use of the Nation's airspace, while minimizing constraints on its use. The operation of the system to meet this objective must itself be efficient. Specific objectives include:

- Having an operating national airspace system in place that meets the national aviation demand at the time it is required.
- Accommodating increasing demand in a way that allows airspace users to operate with a minimum of artificial constraints and with fuel efficiency.
- Reducing operational errors by 80 percent between 1984 and 1995. Techniques for more accurate classification and counting have been developed.
- Reducing risks of midair and surface traffic collisions, landing and weather-related accidents, and collisions with the ground.
- Increasing air traffic controller and flight specialist productivity by a factor of at least two by the year 2000, compared with 1980. The productivity goal for the year 2000 is 10,982 operations per position per year.
- Reducing the technical staff required to maintain and operate the modernized and expanded system by one-third by the year 2000, compared with 1980. By the year 2000, the technical staff is expected to be 7,735.
- Maintaining overall cost of operations of the National Airspace System at the 1980 level, when adjusted for inflation, excluding the capital cost of modernization. Field operations include en route and terminal air traffic control, flight service stations, and field maintenance (1980 budgeted cost: $1.48 billion).

The United States National Airspace System is the busiest in the world. Today, aircraft are more versatile, productive, and dependable, and because of these attributes, there is an increase in aircraft usage. In fact, in fiscal year 1989, approximately 234,000 aircraft shared the American airspace.

The Nation's need for air safety and economic growth requires accommodating growth of aviation activity. In doing this, safe, efficient, and accessible travel must be maintained. The comprehensive National Airspace System Plan will be a significant part of this achievement.

The following table depicts the expansion anticipated in aviation and highlights the years 1982, 1985, 1990, 1995, and 2000.

TOTAL NATIONAL AIRSPACE SYSTEM ACTIVITY

	1982	1985	1990	1995	2000	Percent Growth 1982-2000
NPIAS Airports (Existing)*	3195	3219	3472	3600	3750	17.4
Airport Operations (millions)						
Aircraft Operations*	127.6	143.0	146.1	165.6	185.1	45.1
Itinerant Operations*	68.0	78.8	86.0	98.9	111.6	64.1
Instrument Operations	31.7	38.7	46.4	53.4	58.6	84.9
Towered Airport Operations	50.6	57.9	62.8	70.9	78.0	54.2
ARTCC Operations (millions)						
IFR Aircraft Handled	27.9	32.7	37.8	42.8	46.9	68.1
ACF Approach Control Operations**	---	---	---	---	58.6	---
FSS Service (millions)	62.4	52.9	44.9	45.1	47.1	(24.5)
Hours Flown (millions)						
Air Carrier	6.1	7.4	10.6	12.1	13.1	114.8
General Aviation	37.7	36.2	34.0	37.0	39.9	5.8
Military	6.2	5.9	6.0	6.1	6.2	---
Domestic Enplanements (Revenue Passengers) (millions)						
Air Carrier	272.8	350.4	430.6	529.6	645.3	136.6
Commuter	17.8	24.4	34.9	49.5	67.3	278.1
Aircraft Fleet (thousands)						
Air Carrier	2.5	2.9	4.1	4.5	4.8	92.0
Commuter***	1.4	1.5	1.8	2.0	2.2	57.1
Total General Aviation	213.3	220.9	212.9	218.2	221.7	3.9
Civil Helicopter***	7.0	7.1	7.0	8.6	10.3	47.1
Total Military	21.7	19.9	19.1	18.1	18.1	(16.6)
Military Helicopter***	9.7	7.3	7.4	6.0	6.0	(38.1)
Pilots (thousands)						
Instrument Rated	252.5	256.6	278.7	297.0	312.0	23.6
Total Pilots	764.2	722.4	704.3	747.2	779.6	2.0

* Aircraft operations forecasts are based on the existing airports included in the National Plan of Integrated Airport Systems (NPIAS).

** Approach control operations conducted for area control facilities equal the number of instrument operations conducted by towers.

*** Civil helicopter and commuter fleets are included in the total general aviation fleet. Military helicopter fleet included in total military fleet.

Sources: National Airspace System (NAS) Plan (September 1989) and the "FAA Aviation Forecasts, Fiscal Years 1990-2001" (FAA-APO 90-1, March 1990 Draft).

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Fiscal Year 1991

Activity	FY 1990 Appropriation	FY 1991 Request	Difference Increase (+) Decrease (-)
Long Range Radar........	$ 64,667,200	$135,844,600	$+ 71,177,400
Automation Equipment....	400,128,600	598,845,000	+ 198,716,400
Other Center Facilities.	281,011,900	315,362,200	+ 34,350,300
Subtotal, Activity 1....	745,807,700	1,050,051,800	+ 304,244,100
Terminal Area Radar.....	170,346,200	195,522,000	+ 25,175,800
Terminal Area Automation............	96,188,500	170,550,000	+ 74,361,500
Other Tower Facilities..	197,735,400	333,278,000	+ 135,542,600
Interim Support Plan....	(71,878,000)*	(99,000,000)*	(+ 27,122,000)*
Subtotal, Activity 2....	464,270,100	699,350,000	+ 235,079,900
Flight Service Stations.	35,763,500	83,801,000	+ 48,037,500
International Flight Service Stations......	-0-	-0-	+ -0-
Subtotal, Activity 3....	35,763,500	83,801,000	+ 48,037,500
VORTAC..................	10,584,800	31,241,000	+ 20,656,200
Low and Medium Frequency Facilities..	-0-	2,615,000	+ 2,615,000
Instrument and Visual Landing Systems.......	85,150,800	145,515,000	60,364,200
Subtotal, Activity 4....	95,735,600	179,371,000	+ 83,635,400
Housing, Utilities, and Miscellaneous.....	267,450,600	316,373,200	+ 48,922,600
Systems Engineering & Integration Support.	(107,817,000)*	(111,000,000)*	(+ 3,183,000)*
Aircraft and Related Equipment.............	12,397,500	29,885,000	+ 17,487,500
Development, Test, and Evaluation............	24,687,200	16,270,000	- 8,417,200
Personnel and Related Expenses......	75,058,800	124,898,000	+ 49,839,200
Budget Authority Totals/Net Difference.	$1,721,171,000 a/	$2,500,000,000	$+778,829,000

* Parenthesis means nonadd.

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a/ The 1990 columns reflect the post-sequester enacted level, as adjusted by proposed reprogramming consistent with the reprogramming provisions in the conference report of the FY 1990 DOT Appropriation Act.

FACILITIES AND EQUIPMENT (AIRPORT AND AIRWAY TRUST FUND)

Budget activities include:

1. Air Route Traffic Control Centers -- Long-range radar, communications and automation equipment provide air traffic controllers information on aircraft positions and weather.

2. Airport Traffic Control Towers -- Terminal area radar, Doppler weather radar, communications and automation equipment aid air traffic controllers in handling air traffic.

3. Flight Service Facilities -- Flight service stations and associated facilities provide flight assistance to pilots, particularly general aviation pilots.

4. Air Navigation Facilities -- Very high, medium, and low frequency facilities are used to define airways and air routes and provide distance, direction and weather information to pilots. Precision landing systems, distance measuring equipment and visual lighting aids assist pilots in making final approaches to airport runways.

5. Housing, Utilities, and Miscellaneous Facilities -- This activity includes general facility support requirements which apply to a wide range of FAA installations.

6. Aircraft and Related Equipment -- This activity includes the procurement, modification, and/or replacement of equipment to inspect the accuracy and other characteristics of navigation and traffic control aids for the air and to conduct research and development activities.

7. Development, Test and Evaluation Facilities -- This activity provides for leasing and improvement of the plant and facilities at the Federal Aviation Administration Technical Center in Atlantic City, New Jersey.

8. Personnel and Related Expenses -- Beginning with the FY 1990 budget request, this activity was introduced to highlight the budget authority requested in this submission for personnel and related expenses. This activity provides for personnel compensation, benefits, travel, the TSSC contract, and other miscellaneous personnel related expenses.

General Statement

The fiscal year 1991 program is a continuation of the Agency's efforts to modernize and improve air traffic control systems and airway facilities services. The requested budget authority totals $2,500,000,000. Detailed justifications, on a project-by-project basis, begin on page F&E-20.

Significant investments for major programs are: ($ in millions)

1. Long Range Radar (LRR) Program, $75.2; Advanced Automation System (AAS), $556.3; and Voice Switching and Control System (VSCS), $185.1.
2. Terminal Doppler Weather Radar (TDWR), $83.7; Airport Surveillance Radar (ASR), $47.4; Remote Maintenance Monitoring System (RMMS), $25.0; Interim Support Plan, $99.0; Los Angeles Basin Facilities Consolidation, $76.1; Dallas/Fort Worth Metroplex, $40.0; and FAA Support of New Denver Airport Establishment, $60.0.
3. Flight Service Station (FSS) Modernization, $47.8.
4. Very High Frequency Omnidirectional Radio Range (VOR) with Distance Measuring Equipment (DME), $29.4; and Establish Microwave Landing System, $35.2.
5. Modernize and Improve Unmanned FAA Airway Facilities, Buildings, and Equipment, $24.4; Systems Engineering and Integration, $111.0; Modernize ADP Facilities; $25.0; and Fuel Tank Replacement, $10.0.
6. Aircraft and Related Equipment, $29.9.
7. Development, Test, and Evaluation, $16.3.
8. Personnel and Related Expenses, $124.9.

The justification is presented in a format which includes a summary level appropriation history for each program dating back to 1982, the FY 1990 appropriation, the FY 1991 request, and a projection for post-1991 estimated project costs. The aggregate costs beyond 1991 are shown for planning purposes only and do not constitute the outyear budget estimates. A statement of "Benefits" is included, along with a general breakdown of the budget year estimated costs by activity or task. At the upper right hand portion of each page of the justification there is a "NAS Plan" reference number, e.g., IV-15. In this example, the budget item requests funding associated with project number 15, chapter IV, of the National Airspace System Plan, September 1989.

Pages F&E-14 through F&E-19 contain an index of all programs included in this budget request which identifies the program title, number of locations, dollar amount, and page number.

FACILITIES AND EQUIPMENT
Summary of Requirements by Activity

Activity		1991 Request
1. Air Route Traffic Control Centers		
a. Long Range Radar		$135,844,600
b. Automation Equipment		598,845,000
c. Other Center Facilities		315,362,200
	Total, Activity 1.	$1,050,051,800
2. Airport Traffic Control Towers		
a. Terminal Area Radar		$195,522,000
b. Terminal Area Automation		170,550,000
c. Other Tower Facilities		333,278,000
(Interim Support Plan)*		(99,000,000)*
	Total, Activity 2.	$699,350,000
3. Flight Service Facilities		
a. Flight Service Stations		$ 83,801,000
b. International Flight Service Stations		-0-
	Total, Activity 3.	$ 83,801,000
4. Air Navigation Facilities		
a. VORTAC		$31,241,000
b. Low and Medium Frequency Facilities		2,615,000
c. Instrument and Visual Landing Systems		145,515,000
	Total, Activity 4.	$179,371,000
5. Housing, Utilities, and Miscellaneous Facilities		
a. Housing		$ -0-
b. Utilities and Miscellaneous Facilities		92,400,100
c. Provide Various Air Navigational Aids/Air Traffic Control Facility Improvements and Support		223,973,100
(Systems Engineering & Integration Support)*		(111,000,000)*
	Total, Activity 5.	$316,373,200
6. Aircraft and Related Equipment		
a. Facilities and Flight Inspection		$27,685,000
b. Training		-0-
c. Logistics, Job Performance, and Other		2,200,000
	Total, Activity 6.	$29,885,000
7. Development, Test, and Evaluation Facilities		
a. Buildings, Construction, and Improvements		$ 8,790,000
b. Equipment		7,480,000
	Total, Activity 7.	$16,270,000
8. Personnel and Related Expenses		
a. Establishment/Improvement of Facilities		$114,410,000
b. Flight Inspection		1,625,000
c. Factory Inspection/Contract Support		6,313,000
d. Aeronautical Center		2,550,000
	Total, Activity 8.	$124,898,000
TOTAL, ALL ACTIVITIES		$2,500,000,000

* Parenthesis means nonadd.

Individual Program Justifications

Project	Locations	Amount	Page No.
1. Air Route Traffic Control Centers			
a. Long Range Radar			
(1) Long Range Radar (LRR) Program	9	$ 75,200,000	F&E-20
(2) Radar Microwave Link (RML) System Replacement/Expansion	24	21,000,000	F&E-21
(3) Provide Next Generation Weather Radar (NEXRAD)	Various	24,736,000	F&E-22
(4) Improve Air Traffic Control En Route Radar Facilities	Various	14,908,600	F&E-23
b. Automation Equipment			
(1) Provide Advanced Automation System (AAS)	Various	556,300,000	F&E-24
(2) En Route Software Development and Integration Support	Various	10,800,000	F&E-26
(3) Central Weather Processor (CWP)	Various	10,000,000	F&E-27
(4) Aeronautical Data Link	Various	10,000,000	F&E-28
(5) Improve En Route Automation Equipment	Various	5,000,000	F&E-29
(6) Automatic Dependent Surveillance (ADS)	2	6,745,000	F&E-30
c. Other Center Facilities			
(1) Provide National Airspace Data Interchange Network Enhancement (NADIN) II	Various	4,500,000	F&E-31
(2) Air Route Traffic Control Center (ARTCC) Improvement/Plant Modernization	Various	46,194,000	F&E-32
(3) Provide Data Multiplexing Network (DMN)	Various	8,000,000	F&E-33
(4) Provide Communications Facilities Consolidation/Networking	Various	2,000,000	F&E-34
(5) Improve En Route Communications and Control Facilities	Various	6,368,200	F&E-35
(6) Upgrade Traffic Management System (TMS)	Various	17,000,000	F&E-36
(7) Voice Switching and Control System (VSCS)	Various	185,100,000	F&E-37
(8) Critical Communications Expansion	Various	12,000,000	F&E-39
(9) High Capacity Voice Recorders (HCVR)	Various	9,100,000	F&E-40
(10) Air Ground Communication Radio Frequency Interference (RFI) Elimination	Various	3,500,000	F&E-41
(11) Establish Remote Communication Facilities (RCF)	Various	3,000,000	F&E-42
(12) Expand/Relocate Remote Communications Facilities (RCF's)	Various	3,000,000	F&E-43
(13) Satellite Communications Circuit Back-up	Various	3,600,000	F&E-44
(14) Alaskan NAS Interfacility Communications Systems (ANICS)	Various	12,000,000	F&E-45
Total, Activity 1		$1,050,051,800	

Project	Locations	Amount	Page No.
2. Airport Traffic Control Towers			
a. Terminal Area Radar			
(1) Provide Terminal Doppler Weather Radar (TDWR)	9	83,700,000	F&E-47
(2) Provide Mode S	Various	37,000,000	F&E-48
(3) Improve/Upgrade Terminal Radar System	Various	5,900,000	F&E-49
(4) Establish/Improve/Upgrade Airport Surveillance Radar (ASR)	Various	47,372,000	F&E-50
(5) Provide Terminal NEXRAD	17	5,000,000	F&E-52
(6) Precision Runway Monitors	1	10,550,000	F&E-53
(7) Airport Surface Detection Equipment (ASDE) Structural Modifications	Various	6,000,000	F&E-54
b. Terminal Area Automation			
(1) Los Angeles Basin Facilities Consolidation	Various	76,100,000	F&E-55
(2) New Austin Airport Program	1	850,000	F&E-56
(3) Provide Mode C Intruder (MCI)	Various	46,000,000	F&E-57
(4) Dallas/Fort Worth Metroplex Expansion	1	40,000,000	F&E-58
(5) Terminal Software Development Support	Various	7,600,000	F&E-59
c. Other Tower Facilities			
(1) Provide Remote Maintenance Monitoring (RMM) Capability	Various	25,000,000	F&E-60
(2) Replace Terminal Air Traffic Control Facilities	10	70,500,000	F&E-61
(3) Modernize Airport Traffic Control Tower/Terminal Radar Approach Control Facilities (ATCT/TRACON)	28	16,657,000	F&E-63
(4) Tower Integration Program	Various	1,650,000	F&E-64
(5) Interim Support Plan (ISP)	Various	99,000,000	F&E-65
(6) Improve Terminal Communications	Various	14,171,000	F&E-66
(7) FAA Support of New Denver Airport Establishment	1	60,000,000	F&E-67
(8) Tower Communications System (TCS)	40	23,000,000	F&E-68
(9) Replacement of Emergency Transcaivers	Various	5,000,000	F&E-69
(10) Provide Radio Control Equipment (RCE)	Various	16,800,000	F&E-70
(11) Establish TRACON Facility	1	1,500,000	F&E-71
Total, Activity 2		$699,350,000	

Project	Locations	Amount	Page No.
3. Flight Service Facilities			
a. Flight Service Stations			
(1) Provide Flight Service Station (FSS) Modernization	Various	$47,800,000	F&E-72
(2) Very High Frequency Direction Finder (DF) Network Program	28	8,000,000	F&E-74
(3) Improve Flight Service Facilities	Various	1,529,000	F&E-75
(4) Weather Message Switching Center Replacement	2	5,000,000	F&E-76
(5) Provide Automated Surface Observing System (ASOS)	Various	6,472,000	F&E-77
(6) Provide Direct User Access Terminal System	Various	15,000,000	F&E-78
b. International Flight Service Stations No projects planned.			
Total, Activity 3		$83,801,000	
4. Air Navigation Facilities			
a. VORTAC			
(1) Very High Frequency Omnidirectional Radio Range (VOR) with Distance Measuring Equipment (DME)	Various	$29,441,000	F&E-79
(2) LORAN-C Monitor System Enhancements	Various	1,000,000	F&E-81
(3) Global Positioning System	7	800,000	F&E-82
b. Low and Medium Frequency Facilities			
(1) Establish/Replace Nondirectional Radio Beacon (NDB) Facilities	50	2,615,000	F&E-83
c. Instrument and Visual Landing Systems			
(1) CAT II/III Microwave Landing System (MLS) and MLS Evaluation Program	Various	35,200,000	F&E-84
(2) Provide Approach Lighting System Improvement Program (ALSIP)	19	12,500,000	F&E-86
(3) Provide Automated Surface Observing System (ASOS)	Various	30,100,000	F&E-87
(4) Establish/Expand Visual Navaids	Various	15,989,000	F&E-88
(5) Establish Instrument Landing System (ILS) CAT I	Various	16,700,000	F&E-89
(6) Replace Instrument Landing System (ILS)	25	25,000,000	F&E-90
(7) Establish/Modernize Runway Visual Range (RVR)	35	5,776,000	F&E-91
(8) Provide Automated Flight Procedures Development for Terminal Navigation Facilities (IAPA)	12	4,250,000	F&E-92
Total, Activity 4		$179,371,000	

Project	Locations	Amount	Page No.
5. Housing, Utilities, and Miscellaneous Facilities			
a. Housing			
No projects planned.			
b. Utilities and Miscellaneous Facilities			
(1) Establish National Radio Communications System (NARACS)	Various	$ 2,300,000	F&E-93
(2) Modernize and Improve FAA Buildings and Equipment	Various	24,366,800	F&E-94
(3) Airport Datum Monument Program	300	1,500,000	F&E-97
(4) Expand Computer-Based Instruction (CBI)	Various	2,900,000	F&E-98
(5) Improve/Replace Electrical Power Systems	Various	9,733,300	F&E-100
(6) Fuel Storage Tank Replacement and Monitoring	Various	10,000,000	F&E-101
(7) Automated Data Processing (ADP) Facilities Management	12	25,000,000	F&E-102
(8) Employee Safety for Airport Traffic Control Towers (ATCT's)	Various	6,500,000	F&E-104
(9) Provide Maintenance Control Centers (MCC's)	Various	5,200,000	F&E-105
(10) Purchase Land or Easement for Existing Facilities	Various	3,000,000	F&E-106
(11) Automated Documentation Development and Maintenance (ADDM)	Various	1,900,000	F&E-107
c. Provide Various Air Navigational Aid/Air Traffic Control Facilities Improvements and Support			
(1) Provide System Engineering and Support Services	Various	111,000,000	F&E-108
(2) Provide Air Navigational Facility/Air Traffic Control System Support	Various	7,500,000	F&E-109
(3) Mike Monroney Aeronautical Center - Lease	1	8,204,100	F&E-110
(4) Logistics Support Services	Various	6,300,000	F&E-111
(5) Improve Air Navigational Aids and Air Traffic Control Facilities	Various	3,500,000	F&E-112
(6) Provide Frequency and Spectrum Engineering	Various	1,900,000	F&E-113
(7) Human Resource Management Plan for NAS Transition/Implementation	Various	1,500,000	F&E-114
(8) Provide Test Equipment, Printed Circuit Board (PCB) Software	Various	3,800,000	F&E-115
(9) Dynamic Ocean Track System Integration (DOTS)	Various	285,000	F&E-116
(10) Contract Support for Advanced Design and Management Control	Various	3,984,000	F&E-117
(11) Independent Operational Test and Evaluation Support (IOT&E)	Various	4,000,000	F&E-118

Project	Locations	Amount	Page No.
(12) Hazardous Materials Management	63	15,000,000	F&E-119
(13) Renovation of Airmen and Aircraft Registry Reporting System	1	10,000,000	F&E-120
(14) Contract Support Services	Various	4,600,000	F&E-121
(15) Aviation Safety Analysis System (ASAS)	Various	25,200,000	F&E-122
(16) NAS Management Automation Program	Various	14,200,000	F&E-123
(17) Transition Planning, Engineering and Coordination of NAS Programs	Various	3,000,000	F&E-124
Total, Activity 5		$316,373,200	
6. Aircraft and Related Equipment			
a. Facilities and Flight Inspection	Systems		
(1) Procure Long-Range International Flight Inspection Aircraft	1 aircraft	$18,600,000	F&E-125
(2) Upgrade Flight Inspection B-727 Aircraft	1	2,795,000	F&E-126
(3) Upgrade Flight Inspection CV-580 Aircraft	1	3,200,000	F&E-127
(4) Procure and Install Marker Beacon Systems	40	470,000	F&E-128
(5) Procure and Install Cockpit Voice Recorders and Flight Data Recorders	36	2,620,000	F&E-129
b. Training			
No projects planned.			
c. Logistics, Job Performance, and Other			
(1) Upgrade Research and Development CV-580 Aircraft	1 aircraft	2,200,000	F&E-130
Total, Activity 6		$29,885,000	
7. Development, Test, and Evaluation			
a. Buildings, Construction, and Improvements	Locations		
(1) FAA Technical Center Building - Lease	1	$5,290,000	F&E-131
(2) Utility Plant Modifications	1	1,800,000	F&E-132
(3) Turbine Rotor Burst Test Facility	1	400,000	F&E-133
(4) General Airport Improvements	1	1,300,000	F&E-134
b. Equipment			
(1) NAS Modernization of System Support Laboratory	1	4,700,000	F&E-136
(2) Establishment of Technical Center Research and Development Laboratory	1	2,000,000	F&E-138
(3) Special Component Evaluation System	1	550,000	F&E-139

Project	Locations	Amount	Page No.
(4) Communication System Modernization Program	1	230,000	F&E-140
Total, Activity 7		$16,270,000	
8. Personnel and Related Expenses			
a. Establishment/Improvement of Facilities		$114,410,000	F&E-142
b. Flight Inspection		1,625,000	F&E-142
c. Factory Inspection/Acquisition Activities		6,313,000	F&E-143
d. Aeronautical Center		2,550,000	F&E-143
Total, Activity 8		$124,898,000	
TOTAL, ALL ACTIVITIES		$2,500,000,000	

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1a(1)   Fiscal Year 1991   NAS Plan: IV-15

Program Title: Long Range Radar (LRR) Program

Amount: $75,200,000   Locations: 9

Basis for Request: The en route air traffic system depends upon long range radar (LRR) systems to provide data about aircraft movements to ensure safe operations and separation of aircraft, and to use the national airspace efficiently. As part of a multiyear program to replace obsolete ARSR-1/2 models and FPS-20/60 series long range radars at joint-use facilities, DOD and FAA have entered into an agreement to share the cost, on a 50-50 basis, to replace the joint surveillance system (JSS) radars at 39 operational facilities and to provide one training and field support facility. The field support facility will include a computer capability to analyze radar performance and to provide software support and enhancements.

Description of Problem: The current air route surveillance radar (ARSR-1/2) and military primary radars (FPS-20/60) at United States Air Force/FAA joint-use sites are 1950 vintage vacuum-tube equipment and require replacement. These radars are difficult and expensive to support logistically.

Description of Solution: Provide $75,200,000 as part of a multiyear program for the FAA share of cost to purchase hardware for 9 locations to replace obsolete long range radars at joint-use facilities. The FY 1991 funding will also provide for spares, test equipment and site implementation for these 9 systems as well as for 17 systems purchased with previous funding. In addition to expanding the joint use of military radars to extend coverage, the LRR program provides target and beacon data to support collocated Mode S equipment. The contract for the multiyear long range radar replacement program was awarded in July 1988 and is currently on schedule for delivery of the first production unit to the FAA in the first quarter of FY 1992.

Benefits: The jointly-developed program to replace the joint surveillance system (JSS) radars with new three-dimensional radars will significantly reduce maintenance workload and logistics costs, resolve problems relating to nonavailability of spare parts required by the older radars, and extend range to 250 nautical miles as compared to the 200 nautical mile range of the older radars. Previous funding has been provided for site surveys, site selection, engineering preproduction activities, and the first 17 LRR systems.

APPROPRIATION SUMMARY

	Locations ARSR Repl	Amount ($000)
Appropriated (FY 1982-1989)	8	$ 92,593.0
FY 1990 Appropriated	9	39,048.0
FY 1991 Request	9	75,200.0
Future Requirement	14	129,259.0
Total	40	$336,100.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Centrally Procured Equipment and Services	9	$75,200.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1a(2) Fiscal Year 1991 NAS Plan: V-3

Program Title: Radar Microwave Link (RML) System Replacement/Expansion

Amount: $21,000,000 Locations: 24

Basis for Request: The existing interfacility communications system is a hybrid of land lines and radio links and a combination of FAA-owned and leased services. Virtually all existing and future FAA facilities have or will have interfacility communications requirements. An FAA-owned RML system will be transformed from mainly just transmitting broadband radar data to an expanded in-house communications trunking role that includes both voice and digital data remoting.

Description of Problem: Increasing costs and low reliability of leased services to provide the required operational interfacility communications capability have prompted FAA to develop a coordinated communications capability that will serve as a general transmission medium. The existing RML equipment must be replaced because it is outdated, labor intensive, and increasingly expensive to support logistically. Additional equipment is needed to complete the highly reliable, FAA-owned network.

Description of Solution: Provide $21,000,000 for a system consisting of replacement RML equipment and expansion sites, as necessary, to build an integrated transmission network with restoral switching at each ARTCC and selected additional locations. The new radio communications link (RCL) system provides communication channels for flight service stations, radars, Mode-S, remote maintenance monitoring, and other equipment in the NAS requiring data and voice transmission media. The initial contract was awarded in FY 1985. The $21,000,000 requested in FY 1991 will be used to provide the restoral switching system. Restoral switching, in the event of failures, will provide for automated rerouting of communications via alternate network paths to maintain critical connections and services.

Benefits: This item will provide reliable transmission of critical voice and data, reduce the cost of interfacility communications, and improve system availability while providing the flexibility to accommodate interfacility requirements of the NAS Plan. Implementation is ongoing with 65 percent of the transmission system complete.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	820	$241,830.0
FY 1990 Appropriated	88	15,000.0
FY 1991 Request	24	21,000.0
Future Requirement	---	6,503.0
Total	932	$284,333.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally Procured Equipment and Services	24	$21,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1a(3) Fiscal Year 1991 NAS Plan: IV-16

Program Title: Provide Next Generation Weather Radar (NEXRAD)

Amount: $24,736,000 Locations: Various

Basis for Request: The weather radar program will establish an aviation weather radar network that will provide accurate aviation weather products (precipitation reflectivity, wind velocity, and turbulence indicators). Doppler weather radar systems will be deployed in the continental U.S. and overseas. Software algorithms will also be furnished to take advantage of the improved radar presentation of weather data.

Description of Problem: Present weather detection systems can only detect and display the location and intensity of precipitation, but do not provide any altitude information. The presence, location, and altitude of such hazardous weather phenomena as turbulence, downbursts, windshear, and hail are not adequately determined.

Description of Solution: Provide $24,736,000 to continue the multiyear procurement of the NEXRAD system. A multiyear contract was awarded in December 1987. These radars will provide for the FAA's en route weather detection needs as well as the weather detection needs of the National Weather Service and the U.S. Air Force Air Weather Service which also share the cost. Modification of software will allow NEXRAD to be used in terminal areas for detection of microbursts and other hazardous weather until an optimized terminal Doppler weather radar (TDWR) is available. Ten NEXRAD systems have been contracted for with options for full production. First operational system is expected in June 1990.

Benefits: The major benefits from deployment of the NEXRAD are an increase in aviation safety resulting from improved detection of hazardous weather, the reduction of weather related delays due to improved forecasts, and a savings in aviation fuel consumption due to improved flight planning capability. In addition, system improvements and capabilities provided by NEXRAD is essential as ATC systems become more automated. Ten NEXRAD systems have been contracted for with options for full production. First operational system is expected in June 1990.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$100,192.0
FY 1990 Appropriated	---	5,718.7
FY 1991 Request	---	24,736.0
Future Requirement	---	49,653.3
Total	115a/	$180,300.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
FAA Share of Cost Associated With NEXRAD Production	Various	$24,736.0

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a/ A total of 115 shared facilities (FAA's dollar share is 20 percent) will be procured under an incrementally funded contract administered by the National Weather Service. In addition, funds have been provided to procure and modify 17 NEXRADs. These modified NEXRAD systems will be used in the terminal area until replaced by the terminal doppler weather radar (TDWR). The modified NEXRAD system will then be redeployed to non-CONUS locations for en route use.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1a(4) Fiscal Year 1991 NAS Plan: VI-16

Program Title: Improve Air Traffic Control En Route Radar Facilities

Amount: $14,908,600 Locations: Various

Basis for Request: The en route surveillance radar systems provide the means for determining positions of aircraft in the National Airspace System (NAS).

Description of Problem: The en route radar surveillance and beacon facilities at various locations need improvements and/or modifications that include state-of-the-art changes to correct deficiencies. In addition, a continuing effort is required to improve long range radar operational performance and reliability and to resolve problems unique to certain radar sites and/or common to the entire radar system.

Description of Solution: Provide $14,908,600 to improve radar coverage and maintainability. The improvements this year focus primarily on multi-year program to replace radomes at en route facilities in order to accommodate the larger Mode S en route antenna. Modification of radar towers is required to support the larger radome. The FY 1991 request of $9.4M will complete the tower modifications for 26 radomes purchased with previous funding and will provide 10 additional radomes and tower modifications.

The FY 1991 request for ATCBI relocation begins a multi-year project to relocate ATCBI equipment made available by Mode S commissionings. The FY 1991 funding will begin the project by initiating engineering analyses and procurement of long lead time items.

Benefits: The planned modifications will improve safety, reduce operating costs, and obtain greater efficiency in en route air traffic control and facility maintenance operations.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$69,285.5
FY 1990 Appropriated	---	4,900.5
FY 1991 Request	---	14,908.6
Future Requirement	---	a/
Total	Various	$89,094.6

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Relocate En Route Long Range Radar Locations	1	$ 3,500.0
2. Replace Radomes & Modify Towers	---	9,400.0
3. ATCRB Relocation	---	1,062.0
4. RML Site Work	2	46.6
5. In-Service Engineering	---	900.6
Total	Various	$14,908.6

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item: 1b(1)   Fiscal Year 1991   NAS Plan: III-12
(En Route)

Program Title: Provide Advanced Automation System (AAS)

Amount: $556,300,000   Locations: Various

Basis for Request: The function and capacity of the current air traffic control (ATC) system must be expanded and improved to increase capacity and improve ATC productivity. The AAS will provide a new automation system that includes controller workstations, computer software, and processors necessary to handle projected air traffic loads in the 1990's and beyond, and improve safety and efficiency.

Description of Problem: Because of the age and design characteristics of the present en route and terminal automation systems, they are limited in capacity and capability, and have a high maintenance cost. These systems must be replaced with a new system that will combine en route and terminal functions into a single automation system that will meet the longer term requirements for availability, expendability, and productivity.

Description of Solution: This request provides funding for the AAS acquisition contract, technical support, expansion of test laboratory at the FAA Technical Center, regional implementation costs, and other costs at the air route traffic control centers (ARTCC's) necessary to implement the AAS.

A contract was awarded for the production and implementation of the AAS in July 1988 after a four-year design competition. Work officially began under the contract in November 1988, after the FAA successfully defended the contract award against a protest by the losing contractor. During FY 1990, factory acceptance tests will be completed on the peripheral adapter module replacement and a system will be delivered to the FAA Technical Center; top-level software reviews will be conducted for the terminal advanced automation system, area control computer complex, and tower control computer complex. To reduce cost and schedule risk, demonstrations will be continued in the areas of man-machine interface, fault tolerance, local area networks, and Ada software. Also during FY 1990, AERA 2 software devlopment will continue and implementation activities will continue at the ARTCC's to prepare the sites for AAS equipment installation.

During FY 1991, the peripheral adapter module replacement item (PAMRI) will become operational at the first site (Seattle ARTCC), site acceptance tests will be completed at the second site, and PAMRI will be delivered to three other sites where operational shakedown tests will begin. Factory acceptance tests will begin on the initial sector suite systems to assure the system meets design requirements prior to shipping the system to the FAA Technical Center for operational test and evaluation. Critical design reviews will be completed on the terminal advanced automation system, area control computer complex, and tower control computer complex software and hardware systems prior to production. Risk reduction demonstrations will continue; AERA 2 operational software development will continue, and work will continue at the ARTCC's to upgrade power systems and prepare the sites for AAS equipment installation.

The Voice Switching and Control System, a separate National Airspace System (NAS) Plan project must be completed and operational in time for the ISSS installation.

Benefits: The advanced automation system will improve the safety and efficiency of the NAS, while minimizing constraints on its use. The AAS will provide the ability to handle safely the growing civil and military air traffic projected beyond the year 2000, and improve the productivity of the air traffic controllers.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 574,126.4
FY 1990 Appropriated	---	365,000.0
FY 1991 Request	---	556,300.0
Future Requirement	---	2,935,500.0
Total	Various	$4,430,926.4

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Prime Contract	---	$256,500.0
2. Support Contracts	---	48,300.0
3. AERA 2	---	13,000.0
4. Regional Costs	---	238,500.0
Total	Various	$556,300.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item: 1b(2) Fiscal Year 1991 NAS Plan: Planned

Program Title: En Route Software Development and Integration Support

Amount: $10,800,000 Locations: Various

Basis for Request: Contractor support is required for the development, integration, and implementation of NAS en route and oceanic software packages to correct operational problems and provide system enhancements. FAA will require contractor support at the FAA Technical Center for the update, integration, and operational implementation of software delivered with present and future NAS Plan projects.

Description of Problem: FAA requirements for software services exceed in-house capabilities. After new systems and new software become operational, problems arise that must be corrected, and several NAS Plan projects will deliver software packages requiring integration and implementation into the NAS system.

Description of Solution: Provide $10,800,000 for contract support for the development and implementation of NAS software. This support will consist of software development to correct deficiencies and add enhancements to the NAS as well as provide for integration and implementation of functional software developed by several contractors as part of other NAS projects.

Specific items that will be funded by the FY 1991 request include: expanding the size of the Host computer tables used in processing flight data; integration of NAS software releases; software support, software license fees and maintenance fees for the oceanic display and planning systems (ODAPS) and offshore flight data processing systems (OFDPS); and continued development of host computer system security enhancements.

Benefits: Contractor support will result in fewer delays in operational release of many national air traffic control operational software improvements and assure that the software will continue to meet current operational requirements. The benefits include greater safety and controller productivity. By providing for the required license and maintenance fees, the ODAPS and OFDPS will continue to operate.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$16,391.0
FY 1990 Appropriated	---	10,830.9
FY 1991 Request	---	10,800.0
Future Requirement	---	26,069.1
Total	Various	$64,091.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Software Development, Documentation, and Implementation Support	Various	$10,800.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1b(3)   Fiscal Year 1991   NAS Plan: III-2
(Flight Service)

Program Title: Central Weather Processor (CWP)

Amount: $10,000,000   Locations: Various

Basis for Request: The central weather processor system consists of two components, a meteorological weather processor (MWP) and a real-time weather processor (RWP). The purpose of this system is to support the center weather service unit (CWSU) meteorologist and provide real-time weather information to air traffic controllers. The MWP and RWP will receive weather information from various sources such as weather radars, meteorological satellites, and the National Weather Service (NWS), process the information, and provide products to air traffic controllers, pilots, and meteorologists. The FAA is coordinating development and procurement efforts with the NWS.

Description of Problem: Accurate, real-time weather information is critical to the safe and efficient operation of the NAS. Today's equipment is inadequate to provide the needed information with the required accuracy and timeliness. CWSU meteorologists are using antequated tools in performing their job and reliable data are not available to controllers in a manner that is easy to use and understood.

Description of Solution: Provide $10,000,000 to continue leasing 23 MWP systems via a 3-year contract signed in September 1989, prepare acquisition documentation for production units of the RWP, and release the RWP production solicitation. The MWP provides an automated workstation for the CWSU meteorologists which provides a capability to more quickly and accurately analyze weather conditions and provide warnings. The RWP will interface NEXRADs covering the entire control area of an ARTCC, mosaic the data from these NEXRADs and provide mosaic products to air traffic controllers via the advanced automation system for display on their sector suite situation displays. The RWP will also provide enhanced NEXRAD information to the CWSU meteorologists and to pilots in flight via an interface with the data link processor.

Benefits: As a result of the CWP, air traffic controllers and meteorologists will have better weather information which they can use to improve tactical and strategic handling of traffic flows and enhance the weather avoidance service provided to pilots.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 54,200.0
FY 1990 Appropriated	---	9,036.0
FY 1991 Request	---	10,000.0
Future Requirement	---	55,400.0
Total	Various	$128,636.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. MWP Procured Leased Services	ARTCC/21 CFCF/2	$ 7,500.0
2. RWP Procured Equipment and Services	ARTCC-ACF/23 Academy/1 FAATC/1	2,500.0
Total	Various	$10,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1b(4) Fiscal Year 1991 NAS Plan: III-5
Flight Service

Program Title: Aeronautical Data Link

Amount: $10,000,000 Locations: Various

Basis for Request: The aeronautical data link program replaces the weather communications processor (WCP) program formerly associated with NAS Plan project III-5. This project has been expanded to accelerate development and implementation of ATC and weather data link services. This system will provide air traffic control communication via data link and accommodate pilot requests for weather products resident in the NAS. The aeronautical data link program will provide all interfaces with Mode S data link equipped aircraft. It will receive and decode requests, obtain requested information from appropriate NAS sources and format and return replies through the Mode S data link.

Description of Problem: The FAA is in the process of implementing substantially increased levels of ground automation within NAS. As air traffic increases so will the routine ATC weather information pilots need via voice communications. This is an increasingly time-consuming and labor-intensive task on resources that can be more efficiently handled through data link communications.

Description of Solution: Provide $10,000,000 for the fourth year of funding of a multiyear program to provide ATC and weather service to aircraft via Mode S data link. This program will interface with the Mode S to receive requests for weather products and to route messages for transmission. Initial contract award for data link processor (DLP) software was February 1988 and for 24 DLP hardware systems was July 1988.

The data link processor will be delivered to the FAA Technical Center in FY 1990 for test and evaluation. In FY 1991, the system will be delivered to the first operational site.

Benefits: The implementation of the initial data link services will provide safety benefits by providing pilots a positive confirmation of ATC clearance as well as direct access to flight-safety-related weather information. Controller and specialist workloads will also be reduced as a result of decreased use of voice communications.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$29,445.5
FY 1990 Appropriated	---	6,695.5
FY 1991 Request	---	10,000.0
Future Requirement	---	4,359.0
Total	Various	$50,500.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally Procured Equipment and Services	Various	$10,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item: 1b(5) Fiscal Year 1991 NAS Plan: Planned

Program Title: Improve En Route Automation Equipment

Amount: $5,000,000 Locations: Various

Basis for Request: En route automation hardware and software upgrades are needed to sustain system reliability and enhance air traffic control center (ARTCC) operations until replacement by the advanced automation system (AAS).

Description of Problem: Components for the existing ARTCC display equipment assemblies are no longer repairable and must be replaced. Replacement many times requires reengineering of the component since the component has become obsolete and is not available.

The mosaic tracking direct access radar channel (MTDARC) used on the Edwards Air Force Base radar approach control (RAPCON) does not have interfacility data transfer (IFDT) with the adjacent ARTCC. Consequently, normal flight data entry and transfer of flight data does not take place and the ARTCC controls flights that should be controlled at Edwards RAPCON. Edwards RAPCON is a participant in the National Expansion Tower En Route Control (ETEC) program. IFDT capability at the Edwards RAPCON is essential for the continued progress of the ETEC program.

Description of Solution: Provide $5,000,000 for en route hardware and software improvements. $4,000,000 is requested to procure replacement components for en route display channels that are no longer logistically supportable. The $1,000,000 is requested to continue to implement a full IFDT network between Edwards RAPCON and the Los Angeles ARTCC through emulation of an automated radar tracking system (ARTS) interface by MTDARC.

Benefits: New equipment will improve reliability and relieve the obsolete equipment logistic support problem. Implementation of the IFDT will allow continued integration of the ETEC program and will contribute to lower controller workloads at the ARTCC, Edwards RAPCON, and other ATC facilities in southern California, thereby increasing the safety and efficiency of the ATC process.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 5,800.0
FY 1990 Appropriated	---	4,923.2
FY 1991 Request	---	5,000.0
Future Requirement	---	22,367.4
Total	Various	$38,090.6

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Replacement Components for En Route Display Channels	---	$4,000.0
2. Interfacility Data Transfer (IFDT)/Edwards AFB RAPCON	1	1,000.0
Total	Various	$5,000.0

FACILITIES AND EQUIPMENT (AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1b(6) Fiscal Year 1991 NAS Plan: VII-10

Program Title: Automatic Dependent Surveillance (ADS)

Amount: $6,745,000 Locations: 2

Basis for Request: ADS is designed to increase safety, efficiency, and capacity of air traffic operations in oceanic areas not serviced by radar. Aircraft automatically transmit data generated from onboard systems via a satellite data link to an air traffic control (ATC) facility. The aircraft's identification, its position in three dimensions, and the time are represented in the data received. Position reports are then processed by the ATC facility and depicted on a display similar to standard controller radar displays. This approach provides near real-time monitoring of aircraft movement and will significantly improve the ability of a controller to interpret and respond to air traffic situations.

Description of Problem: Current oceanic ATC operations are conducted manually because of inadequate surveillance and lack of direct pilot-controller communications. Progress reports and controller communications are presently relayed via high frequency (HF) radio links. Handling delay, and the unreliability of HF radio, limit ATC control actions and result in airspace inefficiency and the inability to approve flight plan changes. This forces aircraft to operate on inefficient routes and altitudes. The ADS system will provide automatic position reporting with a direct communications link between the aircraft and the controller. It will result in a timely position reporting and the capability of increasing airspace capacity, while improving safety and allowing flexibility in flight planning.

Description of Solution: Provide $6,745,000 for procurement of 22 work stations at two locations (New York and Oakland ARTCC's), and for implementation of the aircraft-controller data communications link. When the oceanic control centers are equipped with the work stations, and the data communications link is implemented, direct aircraft-controller communications will be established.

Benefits: Providing oceanic controllers with direct two-way communications with the aircraft will facilitate changing flight plans while airborne, improve aircraft utilization, and make oceanic control more effective and safe. Other benefits include fuel economy and flight plan validation. The ADS system will detect aircraft that inadvertently stray from assigned routes. With near real-time monitoring of the aircraft's position, aircraft deviations and the unauthorized use of prohibited airspace can be reduced or eliminated.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 9,300.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	2	6,745.0
Future Requirement	---	0.0
Total	2	$16,045.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Implement Communication Data Link and Controller Work Stations	2	$6,745.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1c(1) Fiscal Year 1991 NAS Plan: V-7

Program Title: Provide National Airspace Data Interchange Network Enhancement (NADIN) II

Amount: $4,500,000 Locations: Various

Basis for Request: NADIN II is a step in the planned evolutionary expansion of the initial NADIN system. It is required to meet the data transfer requirements of the NAS plan programs coming on line in the 1990's.

Description of Problem: The FAA currently maintains several discrete networks which have evolved over a 10-year period to satisfy separate and isolated communication needs. These discrete networks, in their current configurations, cannot be cost effectively upgraded to meet the communication requirements of the evolving NAS programs.

Description of Solution: Provide $4,500,000 to continue the purchase and installation of the NADIN II network. NADIN will interface with virtually all NAS operational systems which require interfacility data service. The contract was awarded in July 1989.

Benefits: The NADIN II expansion will add increased data transfer capability to the initial NADIN system to support the NAS Plan programs. This project will provide the expanded data switching capability and network monitoring functions required to meet the future FAA communications needs for data switching.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	4	$25,797.0
FY 1990 Appropriated	22	10,998.3
FY 1991 Request	---	4,500.0
Future Requirement	---	1,204.7
Total	Various	$42,500.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Centrally Procured Equipment and Services	---	$4,475.0
2. Regional Site Work	---	25.0
	Various	$4,500.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1c(2) Fiscal Year 1991 NAS Plan: VI-9 & VIII-71

Program Title: Air Route Traffic Control Center (ARTCC) Improvement/ Plant Modernization

Amount: $46,194,000 Locations: Various

Basis for Request: The air route traffic control centers (ARTCC's) in the National Airspace System provide en route separation and safe movement of aircraft. Upgrading the centers' plant and equipment, as well as environmental and security improvements, is necessary periodically to keep pace with the increased use of national airspace.

Description of Problem: Current power and HVAC systems and architectural finishes were installed in the late 1950's and early 1960's. The expected life of these items has been surpassed and this is directly responsible for inefficiencies and inadequacies in the facility plant support systems. Compounding the problem is a three-fold increase in power demand caused by the new NAS systems, particularly the AAS. To support the transition and maintain the current schedule to an area control facility, the facilities will require substantial architectural renovations and major upgrade and expansion to the power and HVAC systems. Without these improvements, the facilities cannot accomodate or support the new NAS equipment.

Description of Solution: Provide $46,194,000 to continue a very critically scheduled funding program of facility modernization at the ARTCC's. The installation of new NAS equipment is strictly dependent on preparation of facilities as planned.

The plant improvements this year focus on renovating space (major removal of asbestos) and replacing/expanding the HVAC and power systems in direct support of the new AAS, VSCS, RCE, and other NAS subsystem installations.

Benefits: This is a collection of improvement projects required to keep the National Airspace System facilities efficient and up-to-date, and prepare to transition to ACF facilities. The projects are for correction of site specific problems or deficiencies and expansion of existing power and HVAC systems.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$68,901.3
FY 1990 Appropriated	---	37,415.9
FY 1991 Request	---	46,194.0
Future Requirement	---	a/
Total	Various	$152,511.2

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Modernization and Upgrade Projects	Various	$46,194.0

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a/ Future requirements will be based on space, power, and environmental requirements of new NAS equipment being delivered in FY 1990 to FY 1997 timeframe.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1c(3) Fiscal Year 1991 NAS Plan: V-2

Program Title: Provide Data Multiplexing Network (DMN)

Amount: $8,000,000 Locations: Various

Basis for Request: The DMN utilizes modern commercial off-the-shelf (COTS) data communications technologies to provide cost effective point-to-point data transmission for the NAS. These technologies include: (1) data multiplexing, which enables a number of independent transmission requirements to be consolidated onto a single circuit; and (2) automated network monitoring and control, which enables the identification of failed network elements from central locations and circuit restoral in real-time.

The DMN project is being accomplished in three phases: phase I addressed existing en route requirements; phase II addressed existing terminal requirements; and phase III will address network expansion and reconfiguration requirements generated by new NAS Plan projects as they reach the operational stage.

Phase I/II service commitments were met via a competitively awarded contract for COTS data communications equipment. The phase I/II network was completed in September 1988. Phase III service commitments will also be met via two competitively awarded contracts for COTS data communications equipment. Phase III contract awards are scheduled for February and June 1990.

Description of Problem: A majority of NAS Plan projects are scheduled for implementation in FY 1991. These projects require DMN circuit end equipment for transmission. FY 1991 funds are needed to ensure FAA's ability to commission critical new systems.

Description of Solution: Provide $8,000,000 for the DMN project. A multi-year contract will be awarded to permit ordering appropriate circuit end equipment for each NAS Plan project requiring it. This equipment will be installed and interconnected in a network which provides the required primary and back-up data communications service.

Benefits: A total capital investment of $25,000,000 in phase I/II network assets currently results in an annual leased communications savings/avoidance of $13,000,000. These savings are primarily due to the reduction in the number of leased circuits required. Based on this phase I/II experience and the DMN phase III life-cycle cost benefit analysis, amortization of phase III network equipment costs will occur in two years or less after being placed into service. Additionally, automated network monitoring and control systems improve the reliability of communications services and reduce maintenance costs.

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$22,435.0
FY 1990 Appropriated	---	7,606.3
FY 1991 Request	---	8,000.0
Future Requirement	---	35,061.7
Total	Various	$73,103.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally Procured Equipment and Services	Various	$8,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1c(4) Fiscal Year 1991 NAS Plan: IV-2

Program Title: Provide Communications Facilities Consolidation/Networking

Amount: $2,000,000 Locations: Various

Basis for Request: The operational capability to provide direct, reliable communications between pilots and air traffic controller and flight service specialists is provided by individual remote transmitters/receivers (RTR), remote center air/ground facilities (RCAG), remote communications outlets (RCO), and backup emergency communications (BUEC) equipment.

Description of Problem: Present day remote air/ground radio communications facilities were established according to regional requirements for each of the three air traffic functions: flight service, en route, and terminal. The resultant mix of existing facilities is costly to maintain (travel to remote sites for equipment certification and repair) and to operate (land line and equipment costs).

Description of Solution: Provide $2,000,000 to incorporate various communication functions into integrated remote communication facilities. Facilities consolidation/networking will combine the three diverse air traffic communications functions into newly established remote communication facilities (RCF), where feasible.

Benefits: The establishment, consolidation, and relocation of remote communication facilities will result in facilities which better serve combined needs of air traffic control and flight service stations.

Consolidation and networking of these facilities into FAA-owned facilities is one step in FAA's program to provide a modern, solid-state, remote monitored radio communications network. This will result in cost savings through reduced land leases, reduction in maintenance travel, reduced power consumption (heating and air-conditioning for separate buildings), and reduction in leased services.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$19,377.8
FY 1990 Appropriated	---	1,969.3
FY 1991 Request	---	2,000.0
Future Requirement	---	a/
Total	Various	$23,347.1

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Regional Site Work to Consolidate Selected VOR/RCF and Hub RTR/RCF Facilities	---	1,000.0
2. Centrally Procured Equipment and Services	---	1,000.0
Total	Various	$2,000.0

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1c(5) Fiscal Year 1991 NAS Plan: III-15 (En Route) & VI-16

Program Title: Improve En Route Communications and Control Facilities

Amount: $6,368,200 Locations: Various

Basis for Request: Air/ground communications improvements are needed to enhance communications between air traffic controllers and pilots.

Description of Problem: In several instances, radio communications between pilots and controllers have been impaired, reduced, or lacking. Corrective action must be taken to preserve safety. Changes in traffic volume and complexity have compounded the problem and require improved air route traffic control center communications.

Description of Solution: Provide $6,368,200 to improve the communications capability and provide support for area control facilities.

Benefits: This is a collection of improvement projects required to keep the National Airspace System facilities efficient and up-to-date. The projects are mainly for correction of site specific problems or deficiencies such as improving ARTCC sectorization and providing backup emergency communications.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$31,405.3
FY 1990 Appropriated	---	8,467.8
FY 1991 Request	---	6,368.2
Future Requirement	---	a/
Total	Various	$46,241.3

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. En Route Communications	7	$2,068.2
2. ACF Support	---	2,000.0
3. In-Service Engineering	---	1,300.0
4. Modernize CERAP	1	1,000.0
Total	Various	$6,368.2

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1c(6) Fiscal Year 1991 NAS Plan: III-6 & Planned

Program Title: Upgrade Traffic Management System (TMS)

Amount: $17,000,000 Locations: Various

Basis for Request: There is a critical need to obtain near-term improvements in system performance and the reduction of aircraft delays while the long-term Phase III TMS program continues to be defined. The required near term improvements include extending Phase II enhancement to operational facilities outside the CONUS ARTCC's, providing additional monitoring capabilities in the central flow facility (CFCF), and beginning implementation of automation which will present strategies to the traffic management specialists for resolving very high levels of system demand. In addition, there exists a need to assess the impact of moving the central flow facility to achieve operational effectiveness.

Description of Problem: There is a critical need to upgrade the TMS to provide more effective and enhanced capabilities to manage the flow of traffic in the National Airspace System (NAS). Flow control techniques are essential to reduce aircraft delays, support projected growth in aviation traffic, effectively utilize data from the National Airspace Management Facility, and to enable real time monitoring of special use airspace to provide full-time use of the NAS to all users.

Description of Solution: Provide $17,000,000 to extend TMS enhancements to selected TRACONS and the Anchorage ARTCC, provide additional workstations in the CFCF, initiate implementation of the automated demand resolution function developed in the ATMS, implement a high data rate interface between the NAS En route Stage A computers and the ETMS. Provide a network for management analysis and projections on traffic, delays, operational errors, personnel staffing and scheduling requirements, and continue the Phase II program definition. Provide for advanced engineering, site selection, and preliminary design for a new central flow facility.

Benefits: The TMS upgrade program will provide a nationally integrated system to improve monitoring of the air traffic system and enhance assessments of system demand and capacity. It will enable traffic management specialists to decrease system delays by employing traffic flow strategies which are highly responsive to existing and projected traffic situations.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$65,955.5
FY 1990 Appropriated	---	17,428.0
FY 1991 Request	---	17,000.0
Future Requirement	---	56,516.5
Total	Various	$156,900.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Hardware Procurement, Software Enhancements, and Documentation	---	$15,000.0
2. Air Traffic Facilities Network	---	1,500.0
3. Advance Engineering to Relocate Central Flow Control Facility	---	500.0
Total	Various	$17,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item: 1c(7) Fiscal Year 1991 NAS Plan: III-11
(En Route)

Program Title: Voice Switching and Control System (VSCS)

Amount: $185,100,000 Locations: Various

Basis for Request: This program will establish a voice switching and control system (VSCS) that will provide voice communications for the initial sector suite systems and the area control facilities for the long term. VSCS will be an integrated air/ground and ground/ground voice communications system that will meet current and future operational and maintenance requirements.

Description of Problem: The introduction of modern and higher levels of automation to meet the increasing demands for service exceeds the capabilities of the agency's various communications facilities and systems. The Bell 300 voice switching system currently used in the air route traffic control centers is not capable of automatic reconfiguration required by the advanced automation system; is not expandable to meet the need of the sector suite common consoles, much less the TRACON consolidation; and is very old with future reliability in question. The current system must be replaced with a state-of-the-art communication system. The VSCS position equipment will be installed in the existing en route controller workstations to allow for an orderly transition to the sector suites of the advanced automation system (AAS). The sector suites cannot be commissioned until the VSCS is in place and operating.

Description of Solution: A contract will be awarded for the production and implementation of the VSCS in FY 1990 at the conclusion of a prototype development competition. During FY 1990, VSCS prototype critical factory acceptance tests will be completed, and the production contract will be awarded. This request provides $185,100,000 to continue the acquisition phase of the VSCS program. Funding will provide for costs associated with the acquisition contract, technical support, and implementation activities. During FY 1991, the production critical design review will be completed; a prototype upgrade will be delivered to the FAA Technical Center; and the production readiness review will be completed.

Benefits: The VSCS will be based on a design concept that will permit standardization of console equipment, switching system interfaces, and radio control equipment. It will provide a very high level of availability in the support of critical functions while in normal backup, emergency, and failure modes. The design will facilitate maintenance while providing efficient utilization of transmission resources. VSCS must be operational before the advanced automation system initial sector suite system can be implemented. The AAS will provide the ability to handle safely the growing civil and military air traffic projected beyond the year 2000 and the capability to consolidate en route and terminal control functions into area control facilities, and improve the productivity of the air traffic controllers.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 63,500.0
FY 1990 Appropriated	---	172,249.7
FY 1991 Request	---	185,100.0
Future Requirement	---	471,503.3
Total	Various	$892,353.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Prime Contract	---	$158,100.0
2. Support Contracts	---	10,300.0
3. Regional Costs	---	16,700.0
Total	Various	$185,100.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1c(8) Fiscal Year 1991 NAS Plan: VII-50

Program Title: Critical Communications Expansion

Amount: $12,000,000 Locations: Various

Basis for Request: FAA is committed to reducing dependence on leased telecommunications in order to improve reliability, flexibility, and survivability as well as control and reduce costs. The acquisition and management of agency-owned telecommunications systems is a key element of FAA's strategy to meet this commitment. Examples of such systems currently implemented or in the process of being implemented include the data multiplexing network, the radio communications link, the national airspace data interchange network (NADIN) 1A, and NADIN II.

Description of Problem: Telecommunications systems owned and managed by FAA require modifications and minor expansions each year to meet new critical requirements. Included are equipment rearrangements, the addition of transmission circuit drop-insert capability; capacity expansion; circuit cutovers and terminal equipment rearrangements; switching system minor expansions, equipment replacements and additional interfaces; and provision of premise equipment for leased services. These network changes must be made continuously to ensure that the network meets operational requirements in a cost-effective manner at all times.

Description of Solution: Provide $12,000,000 to support two telecommunications activities consisting of telecommunications facilities operation and leased communications initiatives.

Benefits: Telecommunications support project efforts will impact NAS telecommunication in these areas:

Operations - increased capacity and capabilities to meet new requirements
Performance - improved reliability, availability, and maintainability
Cost - increased savings/cost avoidance

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$10,300.0
FY 1990 Appropriated	---	11,707.3
FY 1991 Request	---	12,000.0
Future Requirement	---	a/
Total	Various	$34,007.3

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally Procured Equipment and Services	Various	$12,000.0

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a/ Continuing requirement is expected to average about $15 million per year.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1c(9)   Fiscal Year 1991   NAS Plan: III-11
(Terminal)

Program Title: High Capacity Voice Recorders (HCVR)

Amount: $9,100,000   Locations: Various

Basis for Request: This portion of the high capacity voice recorder (HCVR) program will replace existing voice recorders at air traffic control centers (ARTCC's).

Description of Problem: Supply support for existing equipment, in operation since 1970, has been a problem since 1986. In 1983 the manufacturer of our existing recorders discontinued production of recorders. They offered to sell, and the FAA accepted, all remaining stock of spare parts. FAA has not been able to find another supplier of spare parts. We now have to "special order" most spares and have them manufactured on a piece-part basis--a process that is very slow and expensive.

Description of Solution: Provide $9,100,000 for multiyear program for procurement of 50 recorders and 18 portable reproducers to replace existing aging equipment in ARTCC's.

Benefits: Improve the operational reliability of high capacity voice recorders at the ARTCC's.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 500.0
FY 1990 Appropriated	---	8,246.3
FY 1991 Request	---	9,100.0
Future Requirement	---	9,132.7
Total	Various	$26,979.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Centrally Procured Equipment and Services	68 a/	7,150.0
2. Regional Site Work	--	1,950.0
Total	68	$9,100.0

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a/ Consists of 50 recorder and 18 portable reproducer systems.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1c(10)   Fiscal Year 1991   NAS Plan: VII-30

Program Title: Air Ground Communication Radio Frequency Interference (RFI) Elimination

Amount: $3,500,000   Locations: Various

Basis for Request: Replace remote communications facilities (RCF) transmitting and receiving equipment with modern state-of-the-art hardware at selected RCF's to reduce radio frequency interference and improve operational performance.

Description of Problem: The existing equipment uses obsolete technology that is prone to causing and being susceptible to radio frequency interference.

Description of Solution: Provide $3,500,000 to purchase state-of-the-art air/ground communications equipment and ancillary devices, (e.g., multicouplers, transmitter combiners, ferrite isolators) to reduce the generation of and susceptibility to radio frequency interference.

Benefits: This equipment will improve operations by reducing the number of instances of radio frequency interference, increase system availability, and reduce maintenance associated with fewer trouble calls.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	4,923.2
FY 1991 Request	---	3,500.0
Future Requirement	---	a/
Total	Various	$8,423.2

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally Procured Equipment and Services	Various	$3,500.0

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a/ Continuing requirement is expected to average about $5 million per year.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1c(11) Fiscal Year 1991 NAS Plan: VII-(Planned)

Program Title: Establish Remote Communication Facilities (RCFs)

Amount: $3,000,000 Locations: Various

Basis for Request: In order to meet air traffic operational needs for air/ground communications it is essential to establish new RCFs (RCFs include remote center air/ground communications facilities (RCAGs), remote communications outlets (RCOs) and remote transmitter/receivers (RTRs)) based upon resectorization and traffic demands instead of limiting expansion/reconfiguration of the system to present coverage constraints.

Description of Problem: Changes in traffic volume and complexity have compounded system problems and require new and/or improved air/ground communication sites. New equipment must be installed to assure the continuance of high quality communications for air traffic operation.

Description of Solution: Provide $3,000,000 to establish the communications capability and provide support for remote control facilities.

Benefits: These establishments are required to keep the National Airspace System safe and efficient and minimize air traffic delays. The projects are mainly to establish new sites for additional operating positions and airspace resectorizations.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	3,000.0
Future Requirement	---	a/
Total	Various	$3,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Centrally Procured Equipment and Services	---	$2,160.0
2. Regional Cost	---	840.0
Total	Various	$3,000.0

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1c(12)　　Fiscal Year 1991　　NAS Plan: VII-Planned

Program Title: Expand/Relocate Remote Communication Facilities (RCFs)

Amount: $3,000,000　　Locations:- Various

Basis for Request: In order to meet air traffic operational needs for air/ground communications it is essential to expand existing RCFs (RCFs include RCAGs, RCOs and RTRs) by adding air/ground communications frequencies and relocating owned/leased facilities for proper communication coverage. This project will provide a vehicle for facilities to meet specific operational requirements based upon resectorization and traffic demands instead of limiting refinements of the system due to present radio coverage constraints.

Description of Problem: In several instances, radio communications between pilots and air traffic controllers have been impaired, reduced, or lacking. Corrective action must be taken to preserve safety. Changes in traffic volume and complexity have compounded problems and require improved air route traffic control center communication.

Description of Solution: Provide $3,000,000 to improve air-ground communications capability and provide support for remote control facilities.

Benefits: This is a collection of improvement projects required to keep the National Airspace System facilities efficient and up-to-date. The projects are mainly for correction of site specific problems or deficiencies such as establishing additional RCF channels and improving ARTCC sectorization.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	3,000.0
Future Requirement	---	a/
Total	Various	$3,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Centrally Procured Equipment and Services	---	$2,160.0
2. Regional Cost	---	840.0
Total	Various	$3,000.0

---

a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1c(13)   Fiscal Year 1991   NAS Plan: Planned

Program Title: Satellite Communications Circuit Back-up

Amount: $3,600,000   Locations: Various

Basis for Request: The satellite communications circuit back-up project provides design, development, and implementation of a satellite communications system to back up FAA operational communications circuits. The circuits to be covered are primarily those which serve ARTCC's and TRACON's.

Description of Problem: The RCL backbone system is designed to provide alternate routing in case of RCL related outages. However, individual tail circuits, for the most part, do not have alternate routes available. Consequently, most RCL communications requiring tail circuits are subject to single point failure. As these circuits primarily carry ground communications and surveillance radar data, extended outages can result in loss of critical air traffic control communications and/or extensive flight delays. The typical method of providing back-up communications is by leasing an alternate terrestrial communications route. However, this alternative is cost prohibitive for the large number of circuits serving ARTCC's and TRACON's.

Description of Solution: By utilizing a satellite transponder as a shared resource, a large number of circuits can be backed up effectively and economically. The FY 1991 funding will provide back-up for approximately 130 circuits.

Benefits: With satellite back-up, critical air-to-ground communications reliability will be improved substantially, in the most economical way available.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	3,600.0
Future Requirement	---	64,579.0
Total	Various	$68,179.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally Procured Equipment and Services	Various	$3,600.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 1c(14)   Fiscal Year 1991   NAS Plan: Planned

Program Title: Alaskan NAS Interfacility Communications Systems (ANICS)

Amount: $12,000,000   Locations: Various

Basis for Request: The Alaskan NAS Interfacility Communication System (ANICS) project provides redundant satellite earth stations using leased transponders on dual communication satellites for operational communications circuits. The circuits to be covered are primarily those which are critical to provide Air Traffic service for the Alaskan Region. The system can also be used for general purpose interfacility communications and provide the flexibility to accommodate NAS plan requirements.

Description of Problem: The reliability and economy of Alaskan Region NAS interfacility communications between FAA sites must be improved to meet FAA safety and NAS Plan objectives. The reliability of the present single-thread leased satellite interfacility communications is declining with both the number and total duration of outages on critical communication and radar circuits nearly doubling each year since 1987. Extended outages result in dangerous loss of critical air traffic control communications. With the increasing amount of domestic and international Pacific Rim air traffic forecast for the next decade this unreliable system is inadequate. The typical method of providing redundant communications is by leasing alternate terrestrial communication routes. However, this alternative is not available in Alaska. The immediate problem is that the present leased communications satellite providing services in Alaska will reach the end of it's useful life in September 1991. This will require a major interruption of all critical services provided by the leased satellite system now in place while services are transferred to the leased communications replacement satellite which is to be launched in May 1991. Even if this satellite replacement is successful, the FAA circuits will still be a single thread.

Description of Solution: The only feasible solution to the dual problems of reliability and economy in Alaskan interfacility communications is a system of redundant satellite earth stations using leased transponders on dual communication satellites. Phase one (15 critical locations) must be in place by August 1991 in order to provide MINIMAL air traffic capabilities in Alaska should the May 1991 launch not be successful. The FY 1991 funding will provide dual earth stations and leased satellite transponder space for those locations with operationally critical air traffic communications.

Benefits: With the ANICS system redundant critical routes will be created in Alaska, substantially improving NAS communications reliability. ANICS will substantially reduce the annual cost of lease communications in the Alaskan region.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Reprogram Request	---	3,000.0 a/
FY 1991 Request	---	12,000.0
FY 1992 Request	---	18,500.0
Total	Various	$33,500.0

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a/ Request for reprogramming will be submitted prior to Congressional appropriations subcommittee hearings on this budget.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Centrally Procured Equipment and Services	---	$ 9,500.0
2. Regional Site Work	---	2,500.0
Total	Various	$12,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2a(1) Fiscal Year 1991 NAS Plan: IV-18

Program Title: Provide Terminal Doppler Weather Radar (TDWR)

Amount: $83,700,000 Locations: 9

Basis for Request: The weather radar program will establish terminal aviation weather radar capability that will provide accurate aviation weather products (microburst, gust fronts and related hazardous windshear). It will also furnish software algorithms to improve the radar presentation of weather data.

Description of Problem: Present radar systems can only detect the location and intensity of precipitation. The presence, location, and altitude of hazardous weather phenomena such as turbulence, microbursts, and gust front producing windshear conditions are not adequately determined.

Description of Solution: Provide $83,700,000 for procurement of terminal Doppler weather radar systems to be installed at high activity terminal locations that experience microburst and other hazardous weather phenomena. TDWR contract was awarded in November 1988. As TDWR becomes available, the NEXRAD modified for terminal operation will be redeployed to the NEXRAD network.

Benefits: Doppler weather radar in the terminal area will provide an increase in aviation safety resulting from the accurate and timely detection of hazardous aviation weather conditions. Other benefits will be a reduction of weather related arrival and/or departure delays and the resulting savings in aviation fuel consumption. Tests in Memphis, Huntsville, Denver, and Kansas City have provided the basis for TDWR algorithms.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	18	$105,947.0
FY 1990 Appropriated	20	107,000.0
FY 1991 Request	9	83,700.0
Future Requirement	0	25,953.0
Total	47	$322,600.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally Procured Equipment and Services	9	$83,700.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2a(2) Fiscal Year 1991 NAS Plan: IV-12

Program Title: Provide Mode S

Amount: $37,000,000 Locations: Various

Basis for Request: FAA's secondary surveillance capability must be upgraded and Mode S has been selected as the system to supplant the older Air Traffic Control Radar Beacon System (ATCRBS). Although the production buy is funded, resources are required for additional spares, contractor cost growth, and program support.

Description of Problem: The current radar is limited in its ability to keep pace with traffic growth. Without a data link, most of the controller/pilot productivity enhancements inherent in other FAA projects cannot be realized. Labor intensive maintenance and expensive, obsolete parts drive operational costs for current radars ever higher. Problems which led to the FY 1991 request include an increase over original plan in the number of spare parts required, a contractor cost growth for which the government is obligated for an 85 percent share in the fixed price incentive contract, and the need to continue FAA's contract management responsibilities for the program.

Description of Solution: Acquire Mode S ground sensors to relieve the secondary surveillance deficiencies noted above. Provide $37,000,000 to purchase additional spares and contractor repair service, to support regional requirements, support the government's share of the contract cost growth, and to continue program office support.

Benefits: Compared with the current system, Mode S will improve accuracy, reduce interference, replace hard-to-maintain equipment, and improve productivity with a two way data link between aircraft and controllers or data bases on the ground. The major benefits to be afforded this year are adequate supportability of systems to be fielded, meeting the government's share of contractor cost growth, and continuing FAA contract management activities associated with development of the system.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	137	$306,163.0
FY 1990 Appropriated	0	24,615.8
FY 1991 Request	0	37,000.0
Future Requirement	60	127,521.2
Total	197	$495,300.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Prime Contract: cost growth	---	$14,300.0
spares/repair	---	15,800.0
2. Support Contracts	---	6,400.0
3. Regional Support	---	500.0
Total	Various	$37,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2a(3) Fiscal Year 1991 NAS Plan: IV-13 & VI-16

Program Title: Improve/Upgrade Terminal Radar System

Amount: $5,900,000 Locations: Various

Basis for Request: The airport surveillance radar systems provide the means for determining positions of aircraft approaching, departing, and passing through terminal areas.

Description of Problem: The terminal radar surveillance systems at various locations need minor improvements and/or modifications that include state-of-the-art changes to correct deficiencies. In addition, support must be provided to solve problems which occur in the operational system.

Description of Solution: Provide $5,900,000 to accomplish necessary improvements and support.

Benefits: This is a collection of improvement projects required to keep the National Airspace System facilities efficient and up-to-date. The projects are mainly for correction of site specific problems or deficiencies.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$50,878.3
FY 1990 Appropriated	---	7,975.5
FY 1991 Request	---	5,900.0
Future Requirement	---	a/
Total	Various	$64,753.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Provide Terminal Radar In-service Engineering	---	$1,900.0
2. Improve ASR	2	1,294.7
3. Replace Video Mapper	8	875.3
4. Establish Radar Remoting	1	692.5
5. Establish FDIO	6	237.5
6. Provide Digital Video Mapping	---	900.0
Total	Various	$5,900.0

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2a(4) Fiscal Year 1991 NAS Plan: IV-13 & VII-70

Program Title: Establish/Improve/Upgrade Airport Surveillance Radar (ASR)

Amount: $47,372,000 Locations: Various

Basis for Request: FAA provides air traffic control services around busy airports. Controllers use airport surveillance radar (ASR) to portray the precise position of aircraft approaching, departing, and passing through airport terminal areas. New systems must be established to allow controllers to serve airports which have experienced traffic growth. Existing systems must be improved to account for changes in both the airport environment and air traffic.

Description of Problem: Funding is needed to continue construction of the ASR systems at Charlottesville, VA; Nantucket, MA; Gainsville, FL; and Missoula, MT; (the last three of these locations were identified by Congress), and continue the relocations and improvements of existing radars at other locations. At many locations, new ASR-9 radars displace ASR-7/8 radars which must be relocated (or leapfrogged) to replace old ASR-4/5/6 tube-type systems. Many of these radars are analog systems and must be replaced in order to be compatible with the future automated air traffic control system.

Description of Solution: Provide $47,372,000 to continue the establishment of four ASR's and associated equipment, continue necessary ASR improvements, provide for relocations and leapfrogging, and provide initial engineering and programmatic support for procurement and implementation activities associated with replacement of analog radar systems.

Benefits: Terminal radar reduces delays and improves safety at congested airports. During instrument meteorological conditions, the radar gives controllers information which permits aircraft to operate closer together and more frequently. Funding for new and improvements to existing radars ensures the continuation of maximum service capabilities during poor visibility, night time, and impeding local weather conditions.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$627,400.0
FY 1990 Appropriated	---	9,846.3
FY 1991 Request	Various	47,372.0
Future Requirement	---	a/
Total	Various	$684,618.3

---

a/Requirements are based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Continue Installation of ASR	4	$31,503.4
2. ASR 7/8 Leapfrog	12	13,000.0
3. Raise ASR Antennas	3	868.6
4. Terminal Radar Systems Engineering	---	2,000.0
Total	Various	$47,372.0

NOTE: In addition to the above request, radars are included in this budget as follows. The 6 radars for ISP and the Dallas radar are continuation of radars started in FY 1990.

Item	Quantity	Amount
Interim Support Plan (continuation)	6	$52,600.0
Dallas/Ft. Worth Metroplex (cont.)	1	7,900.0
FAA Support of New Denver Airport Establishment	1	8,800.0
	8	$69,300.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2a(5) Fiscal Year 1991 NAS Plan: IV-16

Program Title: Provide Terminal NEXRAD

Amount: $5,000,000 Locations: 17

Basis for Request: The amended weather radar program will establish terminal aviation weather radar capability that will provide accurate aviation weather products (microburst and windshear warnings). It will also furnish software algorithms to improve the radar presentation of weather data.

Description of Problem: Present terminal weather detection systems can only detect the location and intensity of precipitation. The presence, location and altitude of hazardous weather phenomena such as turbulence, downbursts, hail, and microburst-type wind shear conditions are not adequately determined.

Description of Solution: Provide $5,000,000 to fund site acquisition, site preparation, installation, spares, and system interface for the terminal NEXRAD. The procurement of the radar equipment was covered in the FY 1987 budget. These NEXRAD derivatives will be installed at 16 terminal locations that experience microbursts and other hazardous weather phenomena, and one system for support. They will be used in the terminal locations until replaced by the Doppler weather radar. The modified NEXRAD will then be redeployed to en route use.

Benefits: This will provide early implementation of Doppler weather radar into the terminal area providing an increase in aviation safety resulting from the accurate and timely detection of hazardous aviation weather conditions. Other benefits will be a reduction of weather related arrival and/or departure delays and the resulting savings in aviation fuel consumption.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	17	$ 80,500.0
FY 1990 Appropriated	---	11,554.6
FY 1991 Request	---	5,000.0
Future Requirement	---	5,945.4
Total	17	$103,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally Procured Equipment and Services	17	$5,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2a(6) Fiscal Year 1991 NAS Plan: VII-Planned

Program Title: Precision Runway Monitors

Amount: $10,550,000 Locations: 1

Basis for Request: Increasing airport capacity is an urgent FAA mission requirement. Capacity can be increased immediately upon installation of precision runway monitor (PRM) radars and displays. Ten airports have closely spaced parallel runway pairs, the use of which is restricted in instrument meteorological conditions. Many more airports have dual converging, triple, or quadruple parallel runways that also stand to benefit from the new radars.

Description of Problem: Airports with parallel runways can use those runways simultaneously in visual conditions. But in instrument conditions, the runways cannot be used simultaneously unless they are at least 4300 feet apart. A major factor which contributes to this limitation is the accuracy and timeliness of the radar surveillance available to the ground controller monitoring the incoming flights. If the surveillance could be improved, airports could handle more airplanes in bad weather.

Description of Solution: Provide $10,550,000 to continue the program to acquire production sensors having the improved azimuth accuracy and update rate. These funds will be used to take the results from the FY 1989-1990 demonstration program, and use them to complete the design and procure long lead items for a sensor at one additional airport with closely spaced parallel runways.

Benefits: The benefit in terms of delay reduction has been estimated in a 1987 study to be over $347 million in the year 2000 for the ten airports that currently have only restricted use of their parallel runways. The additional sensor will be installed at the airport with the greatest potential benefit.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	1	$ 5,000.0
FY 1990 Appropriated	0	9,354.0
FY 1991 Request	1	10,550.0
Future Requirement	8	33,696.0
Total	10	$58,600.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. System Development	--	$ 4,500.0
2. Production System (Advance Items)	1	1,500.0
3. Maintenance Contract, Raleigh Unit	--	2,000.0
4. Program Support	--	2,550.0
Total	1	$10,550.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2a(7)   Fiscal Year 1991   NAS Plan: IV-14

Program Title: Airport Surface Detection Equipment (ASDE) Structural Modifications

Amount: $6,000,000   Locations: Various

Basis for Request: The ASDE-3 program provides for the establishment of 17 ASDE-3 systems, replacements of 13 ASDE systems, and three additional sensors to satisfy the requirement for three dual sensor systems. A contract was awarded in 1985 and an option was exercised in 1988 to provide the additional sensors. Additional funding is required for higher than expected costs for regional activities.

Description of Problem: Higher than expected costs for regional activities have increased projected total costs to complete the project. Increased costs are associated with strengthening existing air traffic control tower cabs and roofs to accommodate the torque and movement associated with the new ASDE, and providing propane generators for backup electrical service.

Description of Solution: Provide $6,000,000 to complete the tower structural modifications and provide backup electrical service for the ASDE systems.

Benefits: The ASDE programs will provide increased safety for aircraft movement on the airport and increased capacity due to expedited traffic flow. The supplemental funding will provide the tower modifications and backup electrical service that are required to complete the program.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	30	$124,500.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	6,000.0
Future Requirement	---	0.0
Total	Various	$130,500.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Tower Structural Modifications	---	$4,000.0
2. Backup Electrical Service	---	2,000.0
Total	Various	$6,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2b(1)   Fiscal Year 1991   NAS Plan: VIII-20

Program Title: Los Angeles Basin Terminal Radar Approach Control Facilities (TRACON) Consolidation

Amount: $76,100,000   Locations: Various

Basis for Request: Consolidation of four Los Angeles Basin terminal radar approach control facilities (TRACONS) will enhance traffic management in Southern California and will allow more efficient use of the airspace.

Description of Problem: The Los Angeles Basin is surrounded by the Pacific Ocean and the San Rafael, Sierra Madre, Tehachapi, San Gabriel, San Bernardino, San Jacinto and Santa Ana Mountain ranges. The basin area is approximately 75 miles wide and 100 miles long. Instrument operations in Southern California have increased 122 percent over the last 12 years. The combination of increased traffic and airspace complexity necessitates regulatory airspace action in, and adjacent to Los Angeles Basin. The major portion of this airspace below 10,000 feet is currently controlled by TRACON facilities located at Los Angeles, Burbank, El Toro, and Ontario. These four TRACON facilities provide instrument flight rule services for 21 airports within their respective area of jurisdiction. This includes 5 major air carrier airports and 3 military air fields.

Studies addressing the consolidation of terminal radar approach control facilities in the Southern California area can be traced back to the early 1970's. These studies addressed individual facility requirements to improve arrival and departure control procedures, without focusing on the entire Southern California area. Working groups were formed to develop a systems approach to the growing, complex problem of providing optimum service to the maze of airports located in the basin area.

In fiscal year 1988, 2,234,500 instrument operations were recorded, and the forecast calls for well over 3,000,000 a year by the year 2000.

Description of Solution: Provide third year funding of $76,100,000 to construct a building and procure land, and various electronic equipments which includes automation equipment, voice recorders, power systems, voice switching and communication system, and microwave spur links to support the consolidation of the four Los Angeles Basin facilities.

Benefits: This consolidation will enhance safety, improve airspace utilization, and provide an IFR air traffic control system approach for the major hub and satellite reliever airports in Southern California.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 2,750.0
FY 1990 Appropriated	---	18,904.9
FY 1991 Request	---	76,100.0
Future Requirement	---	16,545.1
Total	Various	$114,300.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally Procured Items	Various	$76,100.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item: 2b(2) Fiscal Year 1991 NAS Plan: VII-Planned

Program Title: New Austin Airport Program

Amount: $850,000 Locations: 1

Basis for Request: The new Austin airport program has been developed to meet projected air carrier growth.

Description of Problem: Modernization of the Robert Mueller airport is required to meet projected airport operational needs and accommodate projected air carrier growth. Due to airspace conflict with Bergstrom Air Force Base and the environmental impact on the Austin, the expansion of Robert Mueller Airport is not practical. As a result, the City of Austin decided to build a new airport. The city has completed an environmental impact study on twenty four prospective airport sites. They have selected a site that appears to be the best suited to support the New Austin Airport, which will be located northeast of Manor, Texas.

Description of Solution: The new Austin Airport will increase the number of air carrier gates from the present eleven gates at the Robert Mueller Airport to a configuration of forty gates at the new airport by the year 2006. The FY 1991 request has been submitted for $850,000 to support advanced engineering in the development of the New Austin Airport Program. The funds are to be used by the region for architectural and engineering (A&E) contractor engineering specifications for all facilities. The FAA will provide the required facilities and equipment in support of the National Airspace System (NAS) program.

Benefits: Establishment of the New Austin Airport will reduce airspace congestion caused by military and commercial air traffic, reduce delays, and enhance air traffic safety.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	1	850.0
Future Requirements	---	65,790.0 a/
Total	1	$66,640.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Advanced Engineering for Region	1	$850.0

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2b(3) Fiscal Year 1991 NAS Plan: VIII-22

Program Title: Provide Mode C Intruder (MCI)

Amount: $46,000,000 Locations: Various

Basis for Request: The Mode C Intruder program provides for expanding conflict alert functions at ARTS IIIA facilities to include warnings of potential conflicts between an aircraft under the control of the air traffic controller (associated aircraft) and an aircraft not under the control of the air traffic controller (unassociated aircraft), and repair and support for the ARTS IIIA automation equipment.

Description of Problem: With deregulation of the airline industry and the use of traffic hubbing at selected airports, aviation has undergone significant growth in recent years. This growth has resulted in an increase in potentially hazardous situations arising between associated/unassociated aircraft.

Description of Solution: Provide $40,000,000 in FY 1991 for the continuation of the ARTS IIIA software and hardware procurement that will provide automatic conflict alerts for associated/unassociated aircraft pairs equipped with Mode C transponders. Provide $6,000,000 for automated test equipment (ATE) software and test fixtures to support repairs of ARTS IIIA automation system equipment and video mappers.

Benefits: Adaptation and installation of Mode C Intruder software and hardware will assist the air traffic controller by expanding the conflict alert function at ARTS IIIA facilities to include associated/unassociated aircraft pairs. The addition of Mode C capability to ARTS IIIA facilities will increase safety by avoiding potentially hazardous situations when an unassociated aircraft intrudes on the airspace of an associated aircraft. ATE will provide for increased maintainability/supportability of the ARTS IIIA automation system and video mappers.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	14,267.3
FY 1991 Request	---	46,000.0
Future Requirement	---	44,222.7
Total	Various	$104,490.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Procure MCI Hardware	---	$40,000.0
2. Automated Test Equipment (Depot)	---	6,000.0
Total	Various	$46,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2b(4) Fiscal Year 1991 NAS Plan: VIII-32

Program Title: Dallas/Fort Worth Metroplex Expansion

Amount: $40,000,000 Locations: 1

Basis for Request: The Dallas/Fort Worth Metroplex Air Traffic System Plan has been developed to meet the current airport activity and forecasted air traffic growth over the next two decades.

Description of Problem: The existing air traffic control system was designed in the late 1960's and has provided adequate air traffic service for the past seventeen years. The increased volume of traffic, coupled with the operational complexity of the airspace encompassing the Dallas/Ft. Worth area has placed constraints on efficient air traffic control operations. Traffic activity has doubled since January 1973 when the airport was officially opened. Airport activity is forecasted to grow to approximately 1,000,000 operations by the turn of the century. In addition, the number of air carrier gates will increase by 75 percent within the next 4 years. Air cargo will also increase at a significant rate over the next decade. Two additional satellite reliever airports are currently under construction to accommodate user requirements in the major metropolitan area encompassing Dallas/Fort Worth.

Description of Solution: An FAA task force working with airport authorities, major air carriers, commuters, general aviation, and the cities of Fort Worth and Dallas developed a total system approach for the future growth of the Dallas/Fort Worth Airport. A program master plan has been developed identifying major improvements and enhancements required as part of the Dallas/Fort Worth Metroplex. Provide $40,000,000 to accomplish the following projects; establish west ATCT; landing aids for west runway: communications facilities: ASDE remoting: install one airport surveillance radar, complete the expansion of the existing Dallas/Fort Worth TRACON, including establishment of additional operating positions; relocation of routes to support restructuring of airways.

Benefits: Airport and airspace capacity will be increased and user delays will be reduced based on the major air traffic procedural changes planned as part of the overall Dallas/Fort Worth Metroplex Program.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 1,470.0
FY 1990 Appropriated	---	52,185.4
FY 1991 Request	1	40,000.0
Future Requirement	---	17,845.0
Total	1	$111,500.4

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Headquarters Procured Equipment and Services	---	$21,200.0
2. Regional Site Work	1	18,800.0
Total	1	$40,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2b(5)   Fiscal Year 1991   NAS Plan: (Planned)

Program Title: Terminal Software Development Support

Amount: $7,600,000   Locations: Various

Basis for Request: This program provides for the modernization and enhancement of the terminal air traffic control system.

Description of Problem: FAA requirements for developing terminal automation enhancement and corrective software exceed in-house capabilities. The development of software for the existing operational automated radar terminal systems (ARTS) must continue until replaced by the terminal advanced automation system (TAAS).

Description of Solution: Provide $7,600,000 for terminal automation system software development. Funding will be used to provide contractor development and integration of ARTS operational software enhancements; development of corrections to software anomalies; development of recoded ARTS software into higher order language; development of a stand alone assembly system interface with ARTS IIA/IIIA field facilities; development of standardized local patches to ARTS IIA and en route automated radar terminal systems (EARTS) software and their integration in national software releases; and development and integration of ARTS IIA/IIIA national patch libraries.

Benefits: Continued support and improvement of the terminal automation systems software will keep the NAS facilities operating until implementation of TAAS. It will assure that software requirements meet current operational needs.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	2,953.9
FY 1991 Request	---	7,600.0
Future Requirement	---	48,400.0
Total	Various	$58,953.9

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Terminal Software Development Support	Various	$7,600.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2c(1) Fiscal Year 1991 NAS Plan: VI-1

Program Title: Provide Remote Maintenance Monitoring (RMM) Capability

Amount: $25,000,000 Locations: Various

Basis for Request: This is a continuation of a multiyear funding requirement to establish the remote maintenance monitoring system (RMMS) in accordance with the requirements and design in the NAS system specifications. Contracts have been awarded in FY 1988 and FY 1989 for processor enhancements, maintenance data terminals, and applications software. Funding is required in FY 1991 for development of data concentrators, maintenance data terminal software, monitor and control software, and retrofit existing subsystems with RMM capability.

Description of Problem: Current maintenance procedures rely on frequent site visits to accomplish the necessary preventive and corrective maintenance tasks. Under the plans for consolidation of the work force into centrally located centers, the level of resources demanded by the number and duration of site visits will not be available. Therefore, a need was identified to provide automated facility performance monitoring and control information to the maintenance specialists at work centers remotely located from the facilities.

Description of Solution: Provide $25,000,000 to continue development, production, and installation of the hardware and software that will enable NAS subsystems to be monitored and controlled from central work stations throughout the NAS. The RMMS will allow the FAA to automate its maintenance operations in an evolutionary fashion to ensure a smooth transition from the present-day methods. The funding will provide modifications to already deployed NAS subsystems for the addition of remote monitoring capabilities (such as radar and environmental systems); software connectivity of newly developed and retrofitted subsystems; and data communications concentrators to support facilities having RMM.

Benefits: The remote maintenance monitoring system will increase work force productivity, support work force consolidation, and will improve the quality of services being provided by NAS facilities and equipment needed for air traffic control. Increased efficiencies in these areas will offset the need to augment the airway facilities staff as the new NAS subsystems become operational. The commissioned retrofitted subsystems (ARSR-1/2, ARSR-3, ATCBI-5, and ILS) are starting to produce benefits due to the RMM.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$193,631.9
FY 1990 Appropriated	---	23,335.7
FY 1991 Request	---	25,000.0
Future Requirement	---	103,532.4
Total	Various	$345,500.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally Procured Equipment and Services	Various	$25,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2c(2)   Fiscal Year 1991   NAS Plan: III-13 (Terminal)

Program Title: Replace Terminal Air Traffic Control Facilities

Amount: $70,500,000   Locations:- 10

Basis for Request: The FAA owns over 400 control towers and replaces various tower facilities and equipment on a continuing basis to provide an acceptable level of safe air traffic control service and to meet current and future operational requirements.

Description of Problem: The increase in terminal air traffic activity has caused an expansion in services such as radar advisory service for aircraft operating under visual flight rules, and special handling for noise abatement programs. Airport expansion has increased the distances from the control tower to outer aircraft movement areas creating blind viewing areas which require special handling by air traffic controllers. Many of the FAA's control tower facilities are 20-40 years old and there is a continuing requirement to replace or modernize several facilities annually.

Description of Solution: Provide funds in the amount of $70,500,000 for the tower replacement program as follows:

A) Provide $44,500,000 for construction and installation costs for six locations initiated in FY 1990.

B) Provide $5,000,000 of first-phase funds for three locations for advance engineering studies, site selection, and architectural and engineering work to be accomplished in FY 1991. This phased funding approach ensures that each project is planned and engineered effectively to meet current and future operational/technical requirements, and that adequate funds are programmed for construction and equipment installation at each site. The total estimated cost of these three facilities is $26.3 Million. Funds for actual construction will be requested in FY 1992 when more precise estimates become available.

C) Provide $21,000,000 for control tower and administrative base building construction at Los Angeles. This project was approved in FY 1986; however, due to schedule delays caused by difficulty in site selection and agreement on architectural design, and increased requirements to meet the growing demand in the Los Angeles area, the major construction work is not expected to start until FY 1991. Because the FY 1986 funds assigned for this project will expire prior to FY 1991, plans are to reprogram those funds to supplement funding in other tower replacement projects already underway which are experiencing funding shortfall and approved changes in scope to meet operational requirements. The Los Angeles project will retain limited funding to complete advance engineering, design, and site selection work. This funding approach allows the FAA to meet the construction requirements of this project based on its revised schedule.

Benefits: Strategic location and adequate height of an air traffic control tower will enable controllers to achieve an aerial view of the airport and see outer aircraft movement areas resulting in enhanced safety and increased capacity.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	54	$243,681.6
FY 1990 Appropriated	7	18,511.0
FY 1991 Request	10	70,500.0
Future Requirement	-- a/	a/
Total	Various	$332,692.6

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Replace Terminal Air Traffic Control Facilities	10	$70,500.0

A) Construction and installation costs for control tower facilities requested for replacement in FY 1990:

Alabama	Illinois	Missouri	Montana	New Mexico
Montgomery	Chicago O'Hare	St. Louis	Helena	Roswell
$4,344,100	$15,493,100	$9,954,200	$1,738,700	$3,866,700

New Jersey
Newark
$9,103,200

B) First phase funding for control tower facilities to be replaced in FY 1991:

California	Illinois	Missouri
San Diego	Chicago (Midway)	Kansas City (MKC)
$1,500,000	$1,500,000	$2,000,000

C) Construction and installation costs for control tower to be replaced at:

California
Los Angeles
$21,000,000

Locations are not in priority order and are subject to change based upon on-site evaluations.

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a/ Future requirements will be based on air traffic requirements which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2c(3) Fiscal Year 1991 NAS Plan: III-13 (Terminal)

Program Title: Modernize Airport Traffic Control Tower/Terminal Radar Approach Control Facilities (ATCT/TRACON)

Amount: $16,657,000 Locations: 28

Basis for Request: Many of the FAA's control towers and terminal facilities, in particular those in the 15-20 year age group and are not candidates for replacement are in need of modernization. The FAA must upgrade and improve various terminal facilities and equipment on a continuing basis to provide an acceptable level of safe service, and to meet current and future operational requirements.

Description of Problem: In many cases, normal equipment/structure wear out renders facilities obsolete or in need of improvements. Also, during the time ATCT/TRACON facilities have been in service, many changes have taken place in operational or safety requirements and energy costs.

Description of Solution: Provide $16,657,000 to improve, repair, and modernize ATCT/TRACON facilities at various locations. These improvements include air conditioner replacements, new wiring, equipment, position reconfiguration, structural repairs, pipes, and general upgrading of the working environment and equipment rooms.

Benefits: Improve the operational efficiency and environment of obsolete and worn out ATCT/TRACON facilities which are not candidates for replacement.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$87,055.8
FY 1990 Appropriated	---	7,111.0
FY 1991 Request	28	16,657.0
Future Requirement	---	a/
Total	Various	$110,823.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Modernize Air Traffic Control Facilities	28	$16,657.0

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2c(4) Fiscal Year 1991 NAS Plan: VIII-Planned

Program Title: Tower Integration Program

Amount: $1,650,000 Locations: Various

Basis for Request: The air traffic control tower (ATCT) integration program will coordinate activities to integrate all National Airspace System projects. It will provide for all system transition planning, including system requirements, deployment, and implementation. The program will ensure that an end-state configuration of the ATCT is defined and maintained, and that the various systems and displays going into the tower are fully integrated.

Description of Problem: There are several NAS Plan projects projected to be installed in FAA's air traffic control towers (for example, LLWAS, DBRITE, ASDE III, TDWR, TCCC, ATCT/MOD, ICSS, and AWIS). Because space is at a premium in most of FAA's towers, the various systems must be fully integrated to assure that the limited space in the tower is utilized most efficiently. In addition, it is imperative that appropriate planning be conducted in the logistics and human engineering areas to insure smooth transition into the end-state system. With 90 projects going into the terminal environment, there must be planning for key site development, DOD-FAA engineering and integration, AT controller training for new NAS Plan procedures, and procedures for providing controllers with critical airport and facility operation information during modernization of the ATCT's.

Description of Solution: Provide $1,650,000 for studies to insure that a standard tower communications signal distribution panel is designed; tower displays including terminal Doppler weather radar, TCCC, and ASDE III are properly integrated into the tower environment; and space requirements are clearly identified.

Benefits: This effort will result in a smooth transition of NAS Plan projects into FAA's air traffic control towers, minimizing disruption with the operating system.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	1,650.0
Future Requirement	---	8,000.0
Total	Various	$9,650.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Conduct Studies on ATCT Integration and Human Interface	Various	$1,650.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2c(5) Fiscal Year 1991 NAS Plan: VIII-51

Program Title: Interim Support Plan (ISP)

Amount: $99,000,000 Locations: Various

Basis for Request: The air traffic control system and related support systems provide for the safe and efficient utilization of the Nation's airspace and support of the air commerce. Continued system support for these activities must be ensured to meet the growing needs of the aviation community.

Description of Problem: The unprecedented growth of air travel coupled with the "mid-course" correction and replanning of some of the programs in the NAS Plan has created a need for adding, refurbishing, and replacing some components of the NAS. These actions are needed to support traffic growth, ensure the reliability of existing ground support systems, and provide interim capabilities prior to the implementation of the NAS programs scheduled for the mid-1990's. We anticipate implementing specific measures to improve the capacity of the current system, account for previously unforeseen growth, and improve survivability of system components.

Description of Solution: Provide $99,000,000 for several projects to improve and supplement the current system. This effort is required to meet increased demands and ensure the reliability of existing systems. It includes: continue the purchase of ARTS III solid-state memory components; purchase additional ARTS III control position equipment; purchase replacement ARTS II tape drives; purchase additional ARTS II control position equipment; provide uninterruptible power systems for selected ARTS II; purchase backup for equipment for the ICSS at IFR locations; purchase additional airport weather sensors; and purchase attendant equipment to establish terminal radars.

Benefits: These projects are required to allow the NAS to function efficiently until implementation of the Advanced Automation System is completed in the late 1990's.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$138,500.0
FY 1990 Appropriated	---	71,878.0
FY 1991 Request	---	99,000.0
Future Requirement	---	120,322.0
Total	Various	$429,700.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally Procured Equipment and Services	---	$99,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2c(6) Fiscal Year 1991 NAS Plan: VI-16

Program Title: Improve Terminal Communications

Amount: $14,171,000 Locations: Various

Basis for Request: The FAA must upgrade and improve various terminal facilities and equipment on a continuing basis to satisfy operational requirements. The communications facilities such as remote transmitter/receiver sites provide the means for continuous reliable air/ground communications for air traffic control service.

Description of Problem: New equipment must be installed, or existing facilities and equipment must be improved, expanded, or relocated to assure the continuance of high quality communications.

Description of Solution: Provide $14,171,000 to improve the communications capability.

Benefits: This is a collection of improvement projects, primarily establishment of additional controller positions, required to keep the national airspace system facilities efficient and up-to-date. The projects are mainly for correction of site specific problems or deficiencies.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$21,439.8
FY 1990 Appropriated	---	13,651.9
FY 1991 Request	---	14,171.0
Future Requirement	---	a/
Total	Various	$49,262.7

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Centrally Procured Equipment and Services	---	$12,093.4
2. Regional Site Work	---	1,427.6
3. In Service Engineering	---	650.0
Total	Various	$14,171.0

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a/ Requirements are based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2c(7) Fiscal Year 1991 NAS Plan: VIII-31

Program Title: FAA Support of New Denver Airport Establishment

Amount: $60,000,000 Locations: 1

Basis for Request: The need to establish new major airports to increase the capacity of the national airport system is essential for the growth and enhancement of air commerce in the United States.

Description of Problem: Expansion of the existing Denver Stapleton Airport is required to meet current airport operations and to accommodate forecasted growth for the future. However, due to physical constraints and environmental problems, this expansion is not practical. Because of these constraints coupled with user-demand for airport services, the decision to build a new airport has been made. The city has completed site selection, environmental impact studies, major land acquisition, and began construction. The new airport is scheduled to open in 1993. The FAA provides the required facilities and equipment and airport improvements in support of the National Airspace System. These requirements include, but are not limited to: establishment of new air traffic control facilities associated with the New Denver Airport, airport surveillance radar (ASR) system, instrument landing systems, approach lights, weather sensors, navigational aids, communications, and other national airspace plan systems and equipment.

Description of Solution: Provide $60,000,000 as the third increment of funding for facilities and equipment support at the New Denver Airport.
FY 1991 funding will provide for a satellite ATCT construction and associated equipment; relocation of one airport surveillance radar; establishment of RMM off-field; and construction of a technical operations center.

Benefits: Establishment of a new airport in the Denver, Colorado area will increase the air traffic system capacity, reduce delays, enhance air traffic safety, and allow for future expansion.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 4,000.0
FY 1990 Appropriated	---	39,385.2
FY 1991 Request	1	60,000.0
Future Requirement	---	92,814.8
Total	1	$196,200.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Centrally Procured Equipment and Services	---	$30,000.0
2. Regional Site Work	---	30,000.0
Total	1	$60,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2c(8) Fiscal Year 1991 NAS Plan: II-12 (Terminal)

Program Title: Tower Communications System (TCS)

Amount: $23,000,000 Locations: 40

Basis for Request: Provide reliable air-to-ground and ground-to-ground communications for the airport traffic control towers operated by the Federal Aviation Administration. Forty (38 operational and 2 support) voice switches are required to be installed in airport traffic control towers to meet air traffic operational requirements.

Description of Problem: The Federal Aviation Administration has a continuing program to establish, replace, and modernize airport traffic control towers. These airport traffic control towers cannot be placed in service without a voice switch. The system currently in use at some older tower facilities is obsolete and state-of-the-art integrated communications (radio and interphone) system is essential for air traffic control services. Expansions, relocations, and establishments of tower facilities cannot be accomplished without new switches. Functional capabilities needed in the future are not present in obsolete electromechanical switches.

Description of Solution: Provide $23,000,000 to permit the FAA to award a production contract for voice switching systems. Contract award is scheduled for the second quarter of FY 1991.

Benefits: This procurement will provide the Federal Aviation Administration the capability to operate from the new airport traffic control towers with reliable voice communications for ground-to-ground and air-to-ground communications.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 11,232.0
FY 1990 Appropriated	---	1,969.3
FY 1991 Request	40	23,000.0
Future Requirement	209	126,198.7
Total	249	$162,400.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally Procured Equipment and Services	40	$23,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2c(9) Fiscal Year 1991 NAS Plan: VII-31

Program Title: Replacement of Emergency Transceivers

Amount: $5,000,000 Locations: Various

Basis for Request: Provide emergency transceiver equipment in the ATCT's and TRACON's with state-of-the-art equipment to provide reliable and supportable emergency communications. Emergency transceivers are required in order to provide backup emergency communication capability in the air traffic control operation of the ATCT's, and TRACON's.

Description of Problem: Ninety percent of the emergency transceivers currently in use at the ATCT and TRACON facilities are antiquated and obsolete tube-type equipment. The remaining ten percent of the facility equipment does not meet current radio frequency interference requirements. It is essential that this equipment be replaced to provide state-of-the-art communications for safe air traffic control services that will significantly decrease both maintenance requirements and interference problems.

Description of Solution: Provide $5,000,000 to incrementally fund the purchase of emergency transceivers for approximately 450 ATCT facilities and 188 TRACON facilities and the related equipment, spares and services. This effort ultimately will provide approximately 2,100 VHF and UHF transceivers.

Benefits: This procurement will provide the Federal Aviation Administration the upgrade necessary to maintain backup emergency communication for the ATCT's and TRACON's while reducing maintenance requirements and substantially decreasing radio interference problems.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	5,000.0
Future Requirement	---	58,600.0
Total	Various	$63,600.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally Procured Equipment and Services	Various	$5,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2c(10)　　Fiscal Year 1991　　NAS Plan: V-8

Program Title: Provide Radio Control Equipment (RCE)

Amount: $16,800,000　　Locations: Various

Basis for Request: This project will replace the present radio signaling and tone control equipment, improve operational performance, and reduce maintenance cost. The new control equipment will eliminate operational deficiencies and improve air-ground service. This equipment will be used for control and remote maintenance monitoring of RCAG, RTR, RCF, and RCO facilities.

Description of Problem: The existing tone control equipment incorporates obsolete tube/relay devices that have readily recognizable operational and functional system deficiencies, such as push-to-talk keying-delays, false transfers of equipment, no main/standby equipment status readback, improper impedance switching, and low unit reliability. The existing system is not transparent to user demands and reconfigurations which leads to lowered productivity and inefficiency. The new equipment must meet current and future requirements of the terminal TRACON, the automated flight service station, and the ACF area consolidation.

Description of Solution: Provide radio control equipment (RCE) that is of single design, modular, flexible, and expandable which will meet current and future NAS Plan requirements for the terminal/TRACON, AFSS's, and the ACF's. Current requirements focus on the existing leased equipment and RCAG radio interfaces while the future requirements will satisfy interfaces with ISSS-VSCS-RCE-RCF radios. The funds requested will acquire/install RCE systems in the TRACON/Terminal facilities and meet growth needs in ARTCC's. The systems will be installed on a Turnkey basis.

Benefits: The new equipment will have two-way control data channels, loopback lines tests, in-band signaling, line monitoring and transfer to spare, and split or selective frequency operations on one trunk. The replacement of obsolete radio control equipment will eliminate operational deficiencies and improve air-ground service.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$133,589.6
FY 1990 Appropriated	---	9,846.3
FY 1991 Request	---	16,800.0
Future Requirement	---	85,464.1
Total	Various	$245,700.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Centrally Procured Equipment and Services	---	$14,800.0
2. Regional Site Work	---	2,000.0
Total	Various	$16,800.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 2c(11) Fiscal Year 1991 NAS Plan: Planned

Program Title: Relocate TRACON Facility

Amount: $1,500,000 Locations: 1

Basis for Request: The Chicago O'Hare facility cannot be expanded to meet current and future traffic activity requirements. Further expansion of the existing TRACON, which is located underground beneath the control tower structure, is not feasible. The Chicago TRACON is the second busiest terminal radar control facility in the Unites States, handling over one million flights annually to and from O'Hare International Airport and at surrounding satellite airports including Chicago Midway. Over the past decade, operations at the O'Hare TRACON have increased by five percent and are forecast to grow an additional six percent over the next decade. Operations at Midway airport (approach control services provided by O'Hare TRACON) increased 45 percent in the pat decade and are expected to grow another 31 percent by the end of the 1990's.

Description of Problem: The existing TRACON facility was established in 1971 and has been reconfigured and expanded to its maximum. Further expansion or additions to the existing facility are not practical due to the proximity of the TRACON building to other airport facilities and structures. In addition, the reconfiguration of terminal radar approach control airspace and procedures encompassing the Milwaukee, South Bend, and Rockford facilities is planned as an integral part of the metropolitan TRACON facility. These requirements and recommendations have been identified in a facility staff study as an adjunct to the O'Hare system safety and efficiency review report dated 9/15/88. This report cited space, additional radar position (26 required by FY 1993) and expanded computer capacity and controller recruitment, retention, and training.

Description of Solution: Provide $1,500,000 for advanced engineering, environmental and feasibility studies, and program support, to begin relocation of a major TRACON facility that will provide the space, equipment, and enhancements required to meet urgent operational requirements, improve quality of life, and provide the basis for the recruitment and retention of a qualified work force.

Benefits: Relocation of a major TRACON facility will enhance safety and benefit the users through improved airspace utilization and increased capacity. It will reduce delays and enhance safety in the Great Lakes Area.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	1	1,500.0
Future Requirement	---	115,000.0 a/
Total	1	$116,500.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Advance Engineering/ Environmental/Feasibility Studies and Program Support	1	$1,500.0

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a/Preliminary estimate. Final estimate will be based on a cost analysis to be accomplished.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 3a(1)   Fiscal Year 1991   NAS Plan: III-1 (Flight Service) & VI-10

Program Title: Provide Flight Service Station (FSS) Modernization

Amount: $47,800,000   Locations: Various

Basis for Request: The flight service station (FSS) modernization program provides for an automated national aeronautical and meteorological information dissemination system to replace the present labor-intensive manual technique of providing flight services.

Description of Problem: The activities to establish a modernized configuration of 61 automated flight service stations (AFSS) and to consolidate existing flight service stations (FSS) are underway. The first major phase of automation was the commissioning of Model 1 flight service automation systems (FSAS) in 37 AFSS's which was completed in FY 1987. In 1988 two additional AFSS's were equipped with Model 1 as required by legislation, for a total of 39.

The second FSAS phase involves a retrofit of the 39 Model 1 systems to Model 1 full capacity (M1FC) and the installation of the upgraded system in the remaining 22 AFSS's. The M1FC design will support total consolidation of the existing non-automated facilities. The M1FC is a scaled down version of the Model 2 system originally planned and does not contain weather graphics or the direct user access terminals. The latter two capabilities are essential to the flight service mission but will be implemented external to FSAS, and will be funded separately.

Finally, FSS specialists currently use a variety of equipment and procedures to display critical graphic weather information in the course of pre-flight and inflight assistance to pilots. The existing equipment does not meet operational requirements with respect to types of data available and functional capabilities. A new approach is required to satisfy all operational requirements with a standard uniform system.

Description of Solution: Provide $47,800,000 for the following:

a. Flight Service Station Interfaces $8,500,000 - Prior year appropriations have provided for automation efforts. Funding is required to accomplish the NAS interface in the Model I full capacity program.

b. Establish AFSS $6,300,000 - Provide funding for acquisition and commissioning of 4 standard buildings at Boise, ID, Honolulu, HI, Great Falls, MT, Okland, CA, and minor improvements to other AFSS buildings.

c. Consolidate Flight Service Stations $26,000,000 - The FSS modernization master plan provides for the consolidation of FSS into the 61 automated facilities. Funds are requested to continue consolidation of facilities by closing and relocating approximately 36 additional FSSs in FY 1991. These funds are used to provide remote communication's outlets, communication control equipment and rehabilitate facilities.

d. Interim Weather Graphics $2,000,000 - Funding is requested to support interim leased weather graphics acquired by the regions until such time that a national graphics is in place. Funding will provide for additional position equipment and/or replacement of existing position equipment.

e. Power Condition Systems (PCS) $5,000,000 - Funding for a PCS to protect M1/M1FC and graphic weather display equipment in AFSSs and to reduce the number of Model I Equipment reconfigurations introduced by power fluctuations at AFSSs.

Benefits: Aviation information and weather services are being improved in quality and timeliness, thereby improving safety and fuel savings.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$298,600.0
FY 1990 Appropriated	---	11,000.0
FY 1991 Request	---	47,800.0
Future Requirement		18,500.0
Total	Various	$375,900.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Flight Service Station Interfaces	---	$8,500.0
2. Establish AFSS	---	6,300.0
3. Consolidate FSS	---	26,000.0
4. Interim Weather Graphics	---	2,000.0
5. Power Conditioning Systems		5,000.0
Total	Various	$47,800.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 3a(2) Fiscal Year 1991 NAS Plan: IV-11

Program Title: Very High Frequency Direction Finder (DF) Network Program

Amount: $8,000,000 Locations: 28

Basis for Request: The network of very high frequency (VHF) direction finder (DF) facilities provides emergency assistance to lost or disoriented pilots. This system has contributed significantly to the safety of human lives and property.

Description of Problem: Direction finder (DF) service is required in the National Airspace System to meet operational needs for coverage down to 2,000 feet above terrain along major visual flight rule (VFR) flyways in nonradar areas. To accommodate this requirement, additional DF establishments and replacement of some existing unreliable systems is necessary.

Description of Solution: Provide $8,000,000 to procure 28 direction finder systems to replace older existing systems that are difficult to support. Of the 195 systems in this program, 140 are for replacement of existing equipment and 55 are new establishments to implement the direction finder network plan for automated flight service stations.

Benefits: Replacement of the systems with current state-of-the-art equipment will alleviate the logistics/maintenance support problems and also improve operational capabilities. The remoting of systems will allow consolidating of flight service stations into automated flight service stations.

APPROPRIATION SUMMARY

	Quantity	Amount ($000)
Appropriated (FY 1982-1989)	111	$74,694.2
FY 1990 Appropriated	56	14,769.5
FY 1991 Request	28	8,000.0
Future Requirement	---	a/
	195	$97,463.7

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Quantity	Estimated Cost ($000)
Replace DF Facilities	28	$8,000.0

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 3a(3)   Fiscal Year 1991   NAS Plan: VI-16

Program Title: Improve Flight Service Facilities

Amount: $1,529,000   Locations: Various

Basis for Request: Flight service facilities must be upgraded and improved on a continuing basis to provide the level of service required by users and to meet current and future operational requirements.

Description of Problem: New equipment must be installed and additional communication outlets provided, or existing facilities and equipment must be improved, expanded, or relocated to assure the continuance of high quality flight services. Environmental improvements for employee health and safety are also required.

Description of Solution: Provide $1,529,000 for relocation of communications facilities and other minor improvements.

Benefits: This is a collection of improvement projects required to keep the National Airspace System facilities efficient and up-to-date. The projects are mainly for correction of site specific problems or deficiencies.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$13,833.9
FY 1990 Appropriated	---	1,132.3
FY 1991 Request	---	1,529.0
Future Requirement	---	a/
Total	Various	$16,495.2

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Improve FSS	---	$ 279.0
2. Relocate RCO	---	750.0
3. Provide FSS In-Service Engineering	---	500.0
Total	Various	$1,529.0

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 3a(4) Fiscal Year 1991 NAS Plan: III-4

Program Title: Weather Message Switching Center Replacement

Amount: $5,000,000 Locations: 2

Basis for Request: The Weather Message Switching Center (WMSC) system located at the National Communications Center (NATCOM) facility is approaching obsolescence. The WMSC provides a central FAA communications point for the collection, storage, and distribution of weather data and Notices to Airmen (NOTAM) data. The Weather Message Switching Center Replacement (WMSCR) program will replace the WMSC with a system that supports all the functions being performed by the WMSC. It will consist of nodes located at the Salt Lake City and Atlanta National Aviation Weather Processor facilities.

Description of Problem: The Weather Message Switching Center replacement system was awarded using prior year appropriations to design, develop, install, and provide limited training. Additional funding is required to provide additional training, spare parts, and contractor support travel which were unfunded contract line items. Funds are now also required for engineering change requests and FAA Technical Center support which represent new requirements.

Description of Solution: Provide $5,000,000 for additional training, logistics, and engineering support.

Benefits: The funding of these activities will allow the WMSCR program to proceed with design, development, installation, and implementation as scheduled, and permit the closing of the NATCOM facility.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$22,900.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	5,000.0
Future Requirement	---	1,000.0
Total	2 a/	$28,900.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
WMSCR Procured Logistics and Services	2	$5,000.0

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a/ The request for each year is for the same 2 locations; nodes at Salt Lake City and Atlanta National Aviation Weather Processor facilities.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 3a(5) Fiscal Year 1991 NAS Plan: III-9
(Flight Service)

Program Title: Provide Automated Surface Observing System (ASOS)

Amount: $6,472,000 Locations: Various

Basis for Request: Accurate, reliable weather information is an integral element in the safe and efficient utilization of the Nation's airspace. The FAA is coordinating development and procurement efforts with the National Weather Service.

Description of Problem: There is a continuing need for weather observations at locations where existing flight service stations are scheduled to be consolidated or relocated to an automated flight service station (AFSS). Personnel assigned to these locations will be transferred and will not be available to continue manual weather observations, or will be reassigned to the collocated AFSS which is not designed to support manual weather observations service over an extended period. Continuation of manual weather observations using contract personnel is becoming cost prohibitive. There is also a need to provide an upgraded service to replace manual observations at towered locations by providing a 24-hour continuous update of the weather elements reported.

Description of Solution: Provide $6,472,000 to continue a multiyear program to establish automated surface observing systems at flight service stations scheduled to be consolidated or relocated, and at airports with air traffic control towers. NWS will procure, install, and maintain this equipment at all locations.

Benefits: The principle benefits to be realized from the implementation of ASOS at airports where an existing FSS provides manual weather observations and at towered airports are the continued capability for IFR flight operations and the improved continuous observation capability at a significantly reduced cost. These systems will provide the user with high quality "real-time" weather information by various means, including the use of computer-generated voice outputs. Based on the anticipated unit cost for ASOS and the current cost of contract weather observations service, it is expected that FAA can recover ASOS costs within two years.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$19,600.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	6,472.0
Future Requirement	---	65,000.0
Total	Various	$91,072.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Centrally Procured Equipment and Services	---	6,212.0
2. Regional Cost	---	260.0
Total	Various	$6,472.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 3a(6) Fiscal Year 1991 NAS Plan: VII - (Planned)

Program Title: Provide Direct User Access Terminal (DUAT) System

Amount: $15,000,000 Locations: Various

Basis for Request: The FSS modernization program provides for an automated national system whereby specialists and pilots alike have direct access to aeronautical and meteorological information. The new system will replace the present labor-intensive manual technique of providing flight services in a cost-effective way.

Description of Problem: The advancing state of technology in today's aviation system has created computer data bases and necessary interconnections to provide automated methods in which pilots obtain critical aeronautical and meteorological information and file flight plans.

Description of Solution: Provide $15,000,000 funding to cover the third year of contract lease costs to provide approximately 4,269,000 annual briefings via a pilot direct access terminal system (DUATS).

Benefits: The DUAT service will provide users with the capability of obtaining aviation weather; aeronautical information, including NOTAM's and flight advisories; and the ability to file flight plans, using privately-owned or leased personal computers. The DUAT system will provide the capability to meet the continuing user demand, satisfy the need for improved technology and avoid the need to provide additional FSS personnel.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	--	$11,000.0
FY 1990 Appropriated	---	8,861.7
FY 1991 Request	---	15,000.0
Future Requirement	---	
Total	Various	$34,861.7 a/

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Pilot Briefings	Estimated Cost ($000)
Leased Services	4,269,000	$15,000.0

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a/ The first three years of DUAT service is to be F&E funded ($34,861,700). Future year requirements will be funded in the Operations appropriation (FY 1992 and beyond).

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 4a(1) Fiscal Year 1991 NAS Plan: IV-3, IV-17 & VI-16

Program Title: Very High Frequency Omnidirectional Radio Range (VOR) With Distance Measuring Equipment (DME)

Amount: $29,441,000 Locations: Various

Basis for Request: VOR, DME, and VORTAC facilities are major components of the air navigation system and are used for en route air navigation and approach purposes by pilots to conduct safe and efficient flights and landings.

Description of Problem:

(a) Establish/Replace DME at VOR Facilities -- Replace existing non-RMM DME's at VOR sites with RMM compatible DME's. Establish DME's at VOR-only facilities to meet operational requirements.

(b) Replace TACAN Antenna -- TACAN provides bearing information for military aircraft and distance information for both military and civil aircraft. FAA, under the FAA Act of 1958, is responsible for the operation, maintenance, and upgrade of the common (civil/military) air navigation system which includes TACAN. Existing TACAN antennas are experiencing logistic support problems which compromise TACAN availability. Replacement of obsolete antennas with low-power TACAN antennas will reduce power consumption requirements from 5,000 to 250 watts, allowing the antennas to operate on batteries as a backup power source and removing the requirement for an engine generator and fuel tank.

A total of 497 antennas are planned for replacement. DOD has provided $16.7 million for procurement of 119 antennas. FAA plans to request a total of $62.2 million to replace the remaining 378 antennas.

(c) Various VOR Improvements -- Some facilities need minor improvements such as conversion to Doppler VOR.

Description of Solution: Provide $29,441,000 to establish DME facilities (en route and terminal); replace TACAN antennas; and other various VOR improvements.

Benefits: The projects will improve operations and facility performance, provide added capabilities, promote safety, reduce logistic support problems, and significantly reduce maintenance problems due to lack of spare parts. In addition, engine generators and fuel tanks are no longer required at TACAN antenna facilities.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$143,628.5
FY 1990 Appropriated	---	10,584.8
FY 1991 Request	---	29,441.0
Future Requirement	---	a/
Total	Various	$183,654.3

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Establish DME	40	$12,000.0
2. Replace TACAN Antenna	103	16,000.0
3. Improve Air Navigation Facilities/In-Service Engineering	Various	1,441.0
Total	Various	$29,441.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 4a(2)	Fiscal Year 1991	NAS Plan: IV-17 & VII - Planned

Program Title: LORAN-C Monitor System Enhancements

Amount: $1,000,000 Locations: Various

Basis for Request: The LORAN-C navigation system, including 27 transmitter stations and 196 signal monitors, is new in its role as a full capability air navigation aid in the National Airspace System (NAS). From the results of studies of the performance of existing LORAN-C transmitters, and the knowledge that signal anomalies will be identified in signal monitor data, it is essential that relocations and enhancements be made in LORAN-C ground equipment to improve its performance in aviation applications.

Description of Problem: The initial deployment of LORAN-C signal monitors will be uniform across the NAS. After the first two years of data collection, some of the monitors will have to be relocated in accordance with actual LORAN-C signal propagation characteristics. Enhancements of the monitors will also be necessary to include experience gained in the initial operational phase.

Description of Solution: Provide $1,000,000 for the first increment of a program to enhance to all aviation signal monitors and to relocate some of the monitors in order to optimize the system.

Benefits: The LORAN-C navigational system will have improved accuracy in operational use.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$48,900.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	1,000.0
Future Requirement	---	4,220.0
Total	Various	$54,120.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/Quantity	Estimated Cost ($000)
Software Additions, Data Format Changes, and Initial Redeployments	Various	$1,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 4a(3) Fiscal Year 1991 NAS Plan: VII-Planned

Program Title: Global Positioning System (GPS)

Amount: $800,000 Locations: 7

Basis for Request: The global positioning system (GPS) is a Department of Defense satellite-based navigation system that will be available worldwide. For the signals to be useful to civil aviation, a monitor system is necessary to report signal degradations to civil users.

Description of Problem: What the DOD GPS system lacks from the standpoint of civil aviation is an instantaneous self-monitoring feature which lets the user know when signal accuracy is degraded. Without this feature, the system cannot be used for instrument approach procedures.

Description of Solution: To make GPS fully usable by civil aviation, FAA will develop a separate integrity monitor system to warn aircraft within ten seconds when signal accuracy is degraded. $800,000 allows for detailed preparation for a monitor system procurement. Included is development of the system requirement, a system specification, a procurement concept, proposal evaluation criteria, deployment readiness review material, and an integrated logistics plan. Procurement of the integrity monitor system is planned for FY 1992.

Benefits: The integrity monitor system will allow GPS satellite signals as an important supplemental system for civil aviation. GPS will provide significant navigation benefits to civil aviation users.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	800.0
Future Requirement	---	9,200.0
Total	7	$10,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
Procurement Preparation	7	$800.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 4b(1) Fiscal Year 1991 NAS Plan: IV-4

Program Title: Establish/Replace Nondirectional Radio Beacon (NDB) Facilities

Amount: $2,615,000 Locations: 50

Basis for Request: The NDB is a low or medium frequency facility which transmits nondirectional radio signals, whereby an aircraft pilot can navigate by determining his bearing with respect to the facility and "home in" on the station.

Description of Problem: A number of the existing NDB systems are unreliable due to age, use, labor intensity, and lack of supply support. Additionally, new systems need to be established to meet operational requirements.

Description of Solution: Provide $2,615,000 to establish and replace NDB facilities.

Benefits: This is a collection of establishment and improvement projects required to meet operational requirements and to keep the national airspace system facilities efficient and up-to-date. The projects are to alleviate the logistics/maintenance support problems and also improve operational capabilities.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	220	$24,322.1
FY 1990 Appropriated	---	0.0
FY 1991 Request	50	2,615.0
Future Requirement	---	a/
Total	273	$26,937.1

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
Establish NDB	29	$ 789.1
Replace NDB	21	1,825.9
Total	50	$2,615.0

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 4c(1) Fiscal Year 1991 NAS Plan: IV-7

Program Title: CAT II/III Microwave Landing System (MLS) and MLS Evaluation Program

Amount: $35,200,000 Locations: Various

Basis for Request: The microwave landing system (MLS) has been adopted as the United States and International Civil Aviation Organization's (ICAO) precision guidance standard to replace the instrument landing system (ILS).

Description of Problem: The precision guidance technology currently provided by FAA in the National Airspace System (NAS) is the Instrument Landing System (ILS). The ILS is a mature technology first introduced by the FAA nearly 50 years ago. The ILS has been a very reliable precision approach system and has served the aviation community well. MLS is a replacement for ILS and is necessary to meet evolving aviation user needs and address specific operational and technical requirements. Over the past 50 years there have been dramatic changes and advancements in aviation technology. Aircraft and avionics have continued to advance and the demand for FAA services has grown exponentially. ILS does not have the capability to satisfy many current and future operational and technical requirements such as: signal reliability, operational flexibility, conformity with all Department of Defense requirements, expansion of transmission channels, and increased capacity.

The FAA's first MLS procurement (178 Category I MLS's) was begun in 1984 but the FAA has had problems with this procurement and has had to terminate the contract for default. To reduce the risk of encountering similar problems in future procurements, Congress directed the FAA to utilize a dual source procurement strategy for the effort to design CAT II/III systems and procure first article CAT II/III MLS test systems.

It is widely acknowledged that MLS is technically superior to ILS, however some aviation industry interests, within the U.S., members of Congress, the Office of the Secretary of Transportation (OST), and the General Accounting Office (GAO) have expressed concerns about the potential operational and economic benefits of MLS. The Deputy Secretary of Transportation charged the FAA with completing an evaluation of MLS benefits before proceeding with a full production contract for CAT II/III MLS's. The FAA began the MLS Evaluation Program after receiving approval from the OST in December 1988.

Description of Solution: Provide $35,200,000 in FY 1991 to initiate the dual source design of CAT II/III MLS leading to test systems and conduct the MLS Evaluation program.

Benefits: The FAA will use this funding to develop and prototype highly advanced CAT II/III MLS's, in preparation for full-scale production, so that the United States will be able to meet its international commitment to establish MLS service. The United States has committed to the member nations of ICAO to provide MLS service equivalent to existing ILS service on United States international runways by January 1, 1998. With this funding, the FAA will also complete the economic and operational evaluation projects necessary to proceed with the next full production CAT II/III MLS contract. The FAA requires full MLS funding in 1991 and to continue progress toward a rational transition to MLS and to minimize the ILS/MLS transition period, and associated expenses, for both industry and the government.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 166,452.5
FY 1990 Appropriated	---	11,815.6
FY 1991 Request	---	35,200.0
Future Requirement	---	899,331.9
Total	Various	$1,112,800.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
Procure for testing Cat II/III Microwave Landing System	Various	$35,200.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 4c(2) Fiscal Year 1991 NAS Plan: IV-10

Program Title: Provide Approach Lighting System Improvement Program (ALSIP)

Amount: $12,500,000 Locations: 19

Basis for Request: Many of the current FAA approach lighting facilities do not have energy-efficient components and utilize rigid structural steel approach light towers to achieve the required lighting plane.

Description of Problem: The existing steel approach light towers are rigid and can severely damage aircraft in the event of an impact. Replacement of the existing rigid tower structures with lightweight, frangible structures that collapse or break apart upon impact will reduce damage to an aircraft which may strike an approach light tower structure during departure or landing. Many of the approach lighting systems also contain electrical components which are not energy efficient and require replacement.

Description of Solution: Provide $12,500,000 to modify the present approach lighting systems by installing lightweight, frangible structures and energy-efficient electrical components.

Benefits: Lightweight, frangible approach light towers will help reduce the severity of accidents and will standardize the design of approach lighting systems (ALS) used at airports. Additionally, replacing electrical equipment at existing high-intensity (ALS) facilities serving Category I runways with medium-intensity systems (MALSR) will result in reduced energy consumption.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	153	$ 82,912.7
FY 1990 Appropriated	31	4,726.2
FY 1991 Request	19	12,500.0
Future Requirement	92	51,473.8
Total	295	$151,612.7

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally-procured Equipment & Regional Site Work	19	$12,500.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 4c(3) Fiscal Year 1991 NAS Plan: III-9
(Flight Service)

Program Title: Provide Automated Surface Observing System (ASOS)

Amount: $30,100,000 Locations: Various

Basis for Request: Accurate, reliable weather information is an integral element in the safe and efficient utilization of the Nation's airspace. ASOS weather information must be collected and distributed to the aviation community.

Description of Problem: Weather observations are required for flight planning, safety and efficiency as prescribed in parts 91, 121, and 135 of the Federal Aviation Regulations at all air carrier terminals and for instrument flight rule (IFR) approaches by commuter and air taxi operators. In addition, the air traffic control system requires weather observations for advisory purposes for flow control, traffic control, and to provide pilot weather briefings. The lack of accurate, reliable weather information decreases flight safety, generates numerous flight plan changes, increases fuel consumption, and inhibits flow control, thereby reducing the safe and efficient utilization of the Nation's airspace.

Description of Solution: Provide $30,100,000 to support the automated surface observing system. NWS will procure, install, and maintain this equipment at all locations.

Benefits: The principal benefit to be realized from the implementation of ASOS at non-towered airports is the increased safety and capability for IFR operations within the United States. These systems will provide the users with high quality "real-time" weather information by various means, including the use of computer-generated voice outputs. ASOS will result in more effective operational decisions based on the availability of accurate, reliable, and timely weather information at additional airports.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 50,684.6
FY 1990 Appropriated	---	10,392.8
FY 1991 Request	---	30,100.0
Future Requirement	---	16,447.2
Total	Various	$107,624.6

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
1. Centrally Procured Support and Services (ASOS)	---	$21,600.0
2. Regional Site Work	---	8,500.0
Total	Various	$30,100.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 4c(4)   Fiscal Year 1991   NAS Plan: IV-9

Program Title: Establish/Expand Visual Navaids

Amount: $15,989,000   Locations: Various

Basis for Request: Visual navaids such as Precision Approach Path Indicator (PAPI) Systems will furnish the pilot with visual approach slope information to provide guidance for safe descent. Runway-end identification lights (REIL) enable pilots to make stabilized descent and approach-slope clearance over obstructions and quickly identify the runway threshold without instruments aboard their aircraft.

Description of Problem: Establishments and improvements to existing precision approach systems will require establishing and upgrading of approach lighting systems consistent with FAA standards. These establishments and improvements will increase airport service and safety.

The pilot's visual identification of the location of the approach end of the runway can be obscured, distracted, or confused by a variety of environmental conditions. Some of these conditions are caused by high ambient light conditions, such as: brightly lighted freeways or boulevards which look like runways; or, highly lighted residential, industrial, or shopping areas which overwhelm the lighting of the approach end of the runway. REIL's provide rapid and positive identification of the approach end of the runway. PAPI's provide visual approach slope information for use during visual flight rule (VFR) weather conditions.

Description of Solution: Provide $15,989,000 to establish PAPI's, REIL's, and additional facilities for straight-in nonprecision approaches.

Benefits: The precision path indicators (PAPI) and runway end indicator approach lights (REIL) enhance safety and regularity of operations during landing operations.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 97,167.3
FY 1990 Appropriated	---	7,384.7
FY 1991 Request	---	15,989.0
Future Requirement	---	a/
Total	Various	$120,541.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Establish REIL	39	$ 6,713.9
2. Establish PAPI	36	7,590.9
3. Retrofit MALSR with Threshold Lights	5	706.4
4. Relocate Middle Marker/VASI	---	77.8
5. In-Service Engineering	---	900.0
Total	80	$15,989.0

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 4c(5)   Fiscal Year 1991   NAS Plan: VII-11

Program Title: Establish Instrument Landing System (ILS) - CAT I

Amount: $16,700,000   Locations: Various

Basis for Request: Instrument landing systems (ILS's) and associated lighting are required, on a limited basis, at medium and large hub airports and their associated reliever airports to solve certain capacity problems until sufficient microwave landing systems (MLS's) are deployed.

Description of Problem: The ILS establishment program was terminated in 1982 when the microwave landing system was adopted as the precision landing system for the National Airspace System beyond the year 2000. The FAA determined that there was an immediate need for precision approach systems at large and medium hub airports and their associated reliever airports to solve capacity problems. The FAA MLS Transition Policy permits limited ILS establishments until sufficient MLS's are deployed.

Description of Solution: Provide $16,700,000 to install approximately 25 instrument landing systems and approach lighting systems, where required, to solve capacity problems at qualified locations.

Benefits: Establishment of ILS's at those qualified locations will satisfy requirements for precision approach capability, and relieve airports facing capacity problems.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 5,900.0
FY 1990 Appropriated	---	9,166.9
FY 1991 Request	---	16,700.0
Future Requirement	---	a/
Total	Various	$31,766.9

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Install ILS and Approach Light System (equipment previously procured)	25	16,700.0

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 4c(6)	Fiscal Year 1991	NAS Plan: VIII-41

Program Title: Replace Instrument Landing System (ILS)

Amount: $25,000,000 Locations: 25

Basis for Request: The instrument landing system (ILS) provides precision guidance (horizontal, vertical, and distance) information to aircraft on approach to a runway. Continued support of these facilities is required to ensure the safe and efficient utilization of the Nation's airspace.

Description of Problem: The manufacturer of the existing 75 CAT II/III (AN/GRN-27) ILS facilities no longer supports these systems, resulting in the Agency paying premium cost on an as needed basis for supply support. The Air Force is currently replacing their AN/GRN-27 systems, and has promised to furnish them to FAA for spare parts, however, they are not yet available. The lack of logistic/maintenance support and age of equipment, along with increased integrity and reliability for CAT II and CAT III operations, necessitates replacement of these systems.

Description of Solution: Provide $25,000,000 to replace the obsolete AN/GRN-27 type instrument landing systems. The replaced systems will provide parts for the remaining in-service systems until all 75 systems are replaced.

Benefits: Replacement of these ILS facilities with current state-of-the-art equipment will alleviate the logistic/maintenance support problems and provide for continued CAT-II/III operations at major airports.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	--	$ 0.0
FY 1990 Appropriated	14	13,750.4
FY 1991 Request	25	25,000.0
Future Requirement	36	36,249.6
Total	75	$75,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Replace ILS	25	$25,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 4c(7) Fiscal Year 1991 NAS Plan: IV-8

Program Title: Establish/Modernize Runway Visual Range (RVR)

Amount: $5,776,000 Locations: 35

Basis for Request: Runway visual range (RVR) equipment provides a standardized, instantaneous, and accurate method of measuring actual meteorological visibility of a precision landing system equipped runway.

Description of Problem: There are various locations that meet the agency's criteria for establishment of RVR facilities and have a benefit/cost ratio of 1.0 or greater. Replacement systems will provide full CAT-II/III performance which is not currently available.

Description of Solution: Provide $5,776,000 to establish and modernize RVR equipment and provide site installation funding at 35 locations.

Benefits: Facilities having runways equipped with precision landing system equipment will show significant improvement in runway visibility. This system will provide pilots important meteorological information prior to reaching a precision approach decision point for completion of landing or take offs.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	246	$38,933.7
FY 1990 Appropriated	28	4,381.6
FY 1991 Request	35	5,776.0
Future Requirement	---	a/
Total	309	$49,091.3

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Establish RVR Facilities	35	$5,776.0

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 4c(8) Fiscal Year 1991 NAS Plan: Planned

Program Title: Provide Automated Flight Procedures Development for Terminal Navigation Facilities (IAPA)

Amount: $4,250,000 Locations: 12

Basis for Request: Terminal navigation aids utilized in the air traffic control system for instrument flight approaches require development of specialized procedures for each facility supported by these aids. These procedures specify courses, minimum altitudes, and ceiling and visibility minima which must be adhered to during flight under instrument flight rules conditions.

Description of Problem: Current, labor-intensive, manual development of these procedures cannot keep pace with the proliferation of new navigational aids in the National Airspace System (NAS), and must be augmented with available automated devices in order to meet current demands. Standard instrument approach procedures (SIAP) currently number approximately 7,400, and the total for all procedures development is increasing at a rate of 5 percent per year. Additionally, approximately 40 percent of current SIAP's require amendment each year. The current rate of increase will continue as additional navigation systems (LORAN C, MLS, GPS, etc.) are added to the NAS, and existing systems are expanded. The current procedures development work force cannot keep pace with the increased demand, utilizing outdated processes on a time-sharing basis. Initial funding for the first phase of this two-phase procurement was requested during the FY 1990 budget process.

Description of Solution: Provide $4,250,000 for the procurement of 69 graphic workstations and associated equipment for the development of instrument approach procedures.

Benefits: The automated workstations for procedures development personnel will provide a capability for meeting requirements for development of approach procedures, utilizing standardized data bases which incorporate terminal en route procedures (TERPS), geodetic calculations, math functions, and graphic display generators. This technology will ensure standardized procedures development, decreased response time, and alleviate significant staffing increases which will be required if the current methodology is not replaced.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	12	3,840.1
FY 1991 Request	12	4,250.0
Future Requirement	---	0.0
Total	24	$8,090.1

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Provide Automated Flight Procedures Workstations and Associated Equipment	Various	$4,250.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No. 5b(1) Fiscal Year 1991 NAS Plan: VI-14

Program Title: Establish National Radio Communications System (NARACS)

Amount: $2,300,000 Locations: Various

Basis for Request: The national radio communications system (NARACS) program supports objectives associated with national policy on emergency mobilization which are contained in the "National Security Decision Directive" (NSDD), numbers 97 and 286.

Description of Problem: The FAA does not have a system-wide alternate or secondary command and control communications capability in the event of major disruption in the leased common carrier services. Such disruptions, either national, regional, or local in scope, would have a major impact on the management and operation of the national airspace system (NAS).

Description of Solution: Provide $2,300,000 to continue the implementation of the national radio communications system and to expand the secure telephone network. Equipment will be procured from contracts previously awarded.

Benefits: The national radio communications system will provide radio communications which are independent of common telecommunication carriers. NARACS supports command and control communications associated with emergencies, management and operational functions, security matters, flight standards and airport activities, accident investigations, and facility maintenance.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$75,595.2
FY 1990 Appropriated	---	4,578.5
FY 1991 Request	---	2,300.0
Future Requirement	---	1,376.5
Total	Various	$83,850.2

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally Procured Equipment & Services	Various	$2,300.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5b(2) Fiscal Year 1991 NAS Plan: VI-8 & 16

Program Title: Modernize and Improve FAA Buildings and Equipment

Amount: $24,366,800 Locations: Various

Basis for Request: A majority of the structures housing and/or supporting electronic systems within the National Airspace System are over 20 years old and will be required beyond the year 2000.

Description of Problem: Many existing structures at various facilities used to house and support the electronic equipment required to operate the National Airspace System were built during the 1940's and 1950's. At the time of construction, very little consideration was given to energy consumption and safety standards. Increased cost for power and fuel has generated the need to retrofit some structures and modify others. Additional modifications and refurbishments are required to extend the service life of these structures to the year 2000 and beyond. Examples of these facilities include shelters for very high frequency omnidirectional ranges (VOR's), radars, radar microwave links (RML's), instrument landing systems (ILS's), engine generators, communication outlets, and other support facilities. Needed improvements include roofing, siding, insulation, construction of partitions to reduce the equipment room size, updating of heating and air-conditioning systems, replacing various operating and working equipments, and other projects designed to extend the service life of structures.

Description of Solution: Provide $24,366,800 to fund this multiyear program to extend the service life of structures used to house and support components of the National Airspace System, and to initiate a systematic program for assessment and modification of buildings in earthquake risk areas.

Benefits: Major benefits are the extension of the service life of the buildings and equipment coupled with reductions in energy consumption.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$46,083.3
FY 1990 Appropriated	---	19,692.6
FY 1991 Request	---	24,366.8
Future Requirement	---	a/
Total	Various	$90,142.7

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Regional Site Work	Various	$24,366.8

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a/ Continuing requirement that is expected to average approximately $25 million per year.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

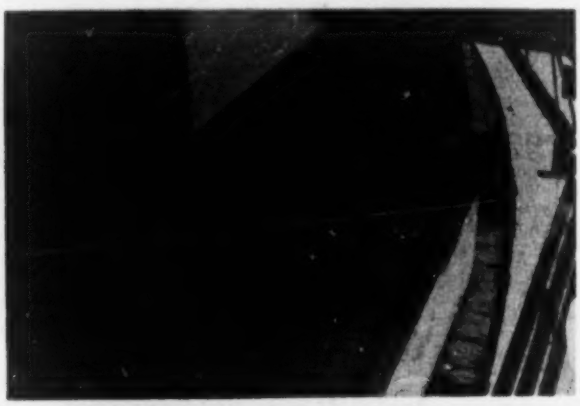
EXAMPLES OF FAA BUILDING OR FACILITIES THAT NEED TO BE MODERNIZED OR IMPROVED

POWER SUBSTATION FOR ALS/GS/LOC HAS CONCRETE PAD DAMAGE DUE TO FROST HEAVE.

FENCE REPAIR FOR LOCATOR/OUTER MARKED REQUIRED DUE TO FROST HEAVE.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

EXAMPLES OF FAA BUILDING OR FACILITIES THAT NEED TO BE MODERNIZED OR IMPROVED



WATER DAMAGE TO UNDERSIDE OF VOR COUNTERPOISE ROOF.

WEAR AND WEATHER DAMAGE TO ENGINE GENERATOR BUILDING DOOR.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5b(3)   Fiscal Year 1991   NAS Plan: VI-16

Program Title: Airport Datum Monument Program

Amount: $1,500,000   Locations: 300

Basis for Request: Accurate positional reference data is essential to the operation of automated navigation and air traffic control (ATC) systems. In turn, navigational/ATC systems have created an urgent need for additional and more accurate positional data.

Description of Problem: Basic data is derived from the airport obstruction survey program conducted by the National Ocean Service (NOS). The extremely accurate data is tied to the North American Datum (NAD) system and is used to form the matrix for the positioning of all data within the ATC system and on aeronautical charts. In 1985, accurate survey data was available for only 733 of 2500 airports that require this data - those airports with instrument approach procedures. Future LORAN C candidate airports will also require accurate positional data in order to construct instrument approach procedures. There are approximately 700 additional airports that are candidates for the LORAN C program.

Description of Solution: Provide $1,500,000 to establish survey monuments on 300 airports per year. The program, beginning in fiscal year 1985 and continuing through fiscal year 1992, will establish survey monuments on each of approximately 1,700 airports thus tying them to NAD system. After completing the surveys from the 1,700 airports with non-precision instrument approach procedures, the program will continue to include surveys for 700 LORAN C airports.

Benefits: (1) Will provide greatly improved accuracy for 2,400 airports to meet requirements and tie these airports into North American Datum. (2) Will directly support instrument approach procedures automation program and the procedures into NAD. (3) Will directly support new airborne navigation system: inertial navigation, flight management systems, etc. (4) Will provide improved accuracy for controller chart supplement used for ATC adaptation data. (5) Will permit the contracting of airport obstruction surveys by commercial contractors to meet expanded digital data requirements.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	1,190	$6,056.0
FY 1990 Appropriated	300	1,476.9
FY 1991 Request	300	1,500.0
Future Requirement	610	3,050.0
Total	2,400	$12,082.9

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
Establish Precision Survey Monuments	300	$1,500.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5b(4) Fiscal Year 1991 NAS Plan: VII-60

Program Title: Expand Computer Based Instruction (CBI)

Amount: $2,900,000 Locations: Various

Basis for Request: Computer based instruction (CBI) is recognized as an effective and efficient training media. It can deliver a maximum amount of training in minimum time, and reduce requirements for instructional services and travel to a central location to deliver equivalent traditional lecture/laboratory-type training. CBI enables the delivery of standardized training, tailored to the needs of the individual being trained. Students can opt to test through portions of a course in which they are already proficient, thus conserving student time. By the end of FY 1990, FAA will have procured 1,817 CBI terminals (system expansion and replacement) for all airway facilities field offices, air route traffic control centers, Level II through V towers, automated flight service stations, aircraft certification regulatory and security field offices.

Description of Problem:
1. No CBI access exists at Level I airport traffic control towers. Level I control towers have no full-time training staff and journeyman controllers must be relieved of air traffic control duties in order to train new controllers. This reduces the time journeyman controllers are available to control traffic, increases overtime usage, and results in non-standard training for developmental controllers.

2. The CBI learning stations used by the FAA Academy for course development and course management are not compatible with current technology, and will require many CBI courses to be maintained on two different types of equipment. This will increase course development costs, waste, resources, and delay expanding and improving CBI courseware.

Description of Solution: Provide $2,900,000 to:
1. Install 100 CBI learning stations in Level I airport traffic control towers.
2. Install 100 CBI learning stations at the FAA Academy.

Benefits: Expanding CBI into Level I airport traffic control towers will establish a capability to train developmental controllers and provide update training for journeyman controllers at locations where training capability does not now exist. Courseware is available to support this training. Installing replacement CBI learning stations at the FAA Academy will eliminate wasteful duplication of course development, and provide an expanded array of CBI facilities.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

APPROPRIATION SUMMARY

	Quantity	Amount ($000)
Appropriated (FY 1982-1989)	1,317	$16,530.0
FY 1990 Appropriated	500 a/	7,478.3
FY 1991 Request	200	2,900.0
Future Requirement	---	a/
Total	2,017	$26,908.3

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Workstations	Estimated Cost ($000)
Centrally Procured Equipment and Services	Various	$2,900.0

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5b(5) Fiscal Year 1991 NAS Plan: VI-7 & VI-16

Program Title: Improve/Replace Electrical Power Systems

Amount: $9,733,300 Locations: Various

Basis for Request: Solid-state electronics equipment being introduced into the National Airspace System (NAS) requires stable power sources, free from surges, to provide reliable operations.

Description of Problem: Many FAA facilities, when constructed, did not require lightning and/or surge protection for the equipment since tube-type equipment operated at higher voltages, was not as susceptible to being damaged by the transient currents created by lightning and other disturbances. To protect the new electronic equipment, lightning and surge protection devices need to be installed in the buildings at the entry point of commercial power sources. Concurrently, it is necessary to provide improved bonding, shielding, and grounding for the new equipment.

In addition, due to the age of the standby power equipment and the reduced power requirements associated with the solid-state electronic equipment, the standby power equipment existing at most facilities needs to be modernized, overhauled, or in some cases, replaced with battery systems.

Description of Solution: Provide $9,733,300 to fund this multiyear program to improve/replace the power sources for the equipment used in the National Airspace System.

Benefits: Major benefits are optimum quality of electrical power necessary to ensure high facility availability and reliability and reduced operating costs and energy consumption of standby power systems at unmanned facilities.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$40,824.3
FY 1990 Appropriated	---	12,000.0
FY 1991 Request	---	9,733.3
Future Requirement	---	a/
Total	Various	$62,557.6

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Regional Site Work	Various	$9,733.3

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5b(6) Fiscal Year 1991 NAS Plan: VII-61

Program Title: Fuel Storage Tank Replacement and Monitoring

Amount: $10,000,000 Locations: Various

Basis for Request: Underground fuel storage tanks installed in the past do not meet newly established environmental standards and must be replaced and monitored.

Description of Problem: The Hazardous and Solid Waste Amendments of 1984 to the Clean Water and Solid Waste Disposal Act levied a requirement on owners of underground petroleum fuel storage tanks to notify local governments of such tanks and to monitor those tanks so that leaks can be detected before they reach ground water. Underground fuel storage tanks of the type FAA has installed in the past have a life expectancy of 15 years. The majority of those installed have been in place for 20 to 25 years. Double walled fiberglass replacement fuel tanks and permanent monitoring wells will be used to eliminate future problems. Approximately 3,150 tanks will have to be replaced.

Description of Solution: Provide $10,000,000 as the fourth increment of a multiyear program to replace and monitor existing underground fuel storage tanks, and replace leaking tanks.

As of September 30, 1989, the FAA has inspected 2306 for our 3150 fuel storage tanks, replaced 283, and converted 45 to propane. FAA plans to inspect 100 tanks, remove 534 tanks, and convert 58 to propane in 1990.

Benefits: The FAA will be in compliance with State and Federal regulations governing storage of fuel in underground storage tanks.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 33,897.7
FY 1990 Appropriated	---	5,907.8
FY 1991 Request	---	10,000.0
Future Requirement	---	156,494.5
Total	Various	$206,300.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Procurement of Tanks and Regional Site Work	Various	$10,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5b(7) Fiscal Year 1991 NAS Plan: VII-2

Program Title: Automated Data Processing (ADP) Facilities Management

Amount: $25,000,000 Locations: 12

Basis for Request: This request continues funding support for the computer resources nucleus (CORN) project which was initially funded as an F&E program in the FY 1989 budget. CORN was born out of the need to address increased demands for general purpose host computer resources from operational and administrative programs within FAA. Currently, these programs computing requirements have increased by a rate that far exceeds the present host capacity.

Description of Problem: The demand for general purpose host processing resources significantly exceeds the available capacities and will get considerably worse by 1990. ADP facilities management under the CORN program addresses this critical problem with the acquisition of ADP services from contractor provided facilities, hardware, software, and staff. During the 10-year contract life, the contractor will be required to meet growing demands for service and to upgrade installed hardware and software to ensure that the most cost-effective technologies are applied to the FAA data processing needs. Some of the areas that have increased workloads that require additional host resources are:

a. Logistics and Inventory Systems
b. Airport Inspection and Certification
c. ADP Configuration Management Information Systems
d. Management of National Airspace Telecommunications
e. DOT-wide Personnel, Accounting, and Payroll Systems
f. Accident Investigation
g. Aircraft Registration
h. Airmen Certification
i. Violation Enforcement

Description of Solution: Provide $25,000,000 for: (1) software conversion of major applications from the old hosts to the new hosts; (2) simultaneous operations of new system with the old system during the test phase and checkout of the new system; and (3) initial startup operations cost for the new contractor provided facility, equipment, staff support, and training. The cost of solicitation preparation, technical and cost evaluations, test plan preparation, and implementation planning is funded under the Operations appropriation. Recurring operations costs in future years would also be funded under the Operations appropriation.

Benefits: The benefits of this funding is an upgraded and common system of ADP support for agencywide use. The expansion of ADP capacity will be made available so that required service levels and productivity can be achieved. Ultimately, funding of this project will yield a cost avoidance of $1.5 billion over the next 10 years. Other benefits include:

Improved ADP service levels
Increased productivity
Improved ADP cost-effectiveness
Minimized risk to FAA

Maintaining security levels
Avoiding lengthy procurement process
Making latest technology available
Providing broadest competition

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 15,000.0
FY 1990 Appropriated	---	8,861.7
FY 1991 Request	12	25,000.0
Future Requirement	---	99,238.3
Total	12 a/	$148,100.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
1. Software Conversion of Major Applications and Implementation	---	$18,000.0
2. Initial Startup and Operations Cost for the Contractor Provided Facility, Equipment, Staff Support	---	7,000.0
Total	12	$25,000.0

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a/ The request for each year is for the same 12 locations.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5b(8) Fiscal Year 1991 NAS Plan: VII - (Planned)

Program Title: Employee Safety for Airport Traffic Control Towers (ATCT's)

Amount: $6,500,000 Locations: Various

Basis for Request: This funding is requested to bring standard and nonstandard design ATCT's into compliance with employee-safety requirements which will reduce the risk of fatalities of serious injuries in the event of fire as required by Executive Order 12196, Occupational Safety and Health Program for Federal Employees.

Description of Problem: The Department of Labor, Occupational Safety and Health Administration (OSHA), requires FAA to bring ATCT's into compliance with FAA Order 3900.32A. Deficiencies exist in approximately 50 percent of the standard ATCT's. The greatest risk exists in nonstandard design ATCT's. Examples of deficiencies to be corrected are: insufficient smoke/fire alarm systems, unprotected exits and improper type or quality of fire extinguishers.

Description of Solution: Provide $6,500,000 to keep ATCT's operating and in compliance with safety requirements for employees. This funding would allow the FAA to complete approximately 50 percent of the non-standard ATCT's by the end of FY 1992 The FAA has an abatement plan totaling $18,500,000. This year's request totals $6,500,000 with $6,584,500 to be requested in future years.

Benefits: This funding would allow FAA to comply with OSHA employee-safety requirements in all standard ATCT's and approximately one-half of the nonstandard ATCT's.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0a/
FY 1990 Appropriated	---	5,415.5
FY 1991 Request	---	6,500.0
Future Requirement	---	6,584.5
Total	Various	$18,500.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Correct Deficiencies in Standard ATCT's	Various	$6,500.0

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a/ Under "Modernize and Improve Unmanned FAA Airway Facilities Building and Equipment" (budget item 5b(2)), $1,937,000 was appropriated for this item in FY 1989.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5b(9) Fiscal Year 1991 NAS Plan: VI-4

Program Title: Provide Maintenance Control Centers (MCC's)

Amount: $5,200,000 Locations: Various

Basis for Request: Efficient management of national airspace system facilities require expanded maintenance control center capabilities.

Description of Problem: Automation of facilities and equipment maintenance under the NAS Plan removes the need for an on-site work force to assure system performance. The operation of all NAS facilities and equipment can be more effectively monitored from general national airspace system (GNAS) sectors, and air route traffic control center (ARTCC) sectors. Each location has a unique set of requirements that are derived from the types of facilities being monitored and from the interface with the Air Traffic Service. The work force consolidation that is presently underway in the GNAS environment highlights the need for timely information on the diversity of complex automation and communications systems. This requires that the system engineer be provided with appropriate information on the performance of these systems to enable him to make the reconfiguration decisions that will maintain the highest level of service for the control of air traffic.

Description of Solution: Provide $5,200,000 for the establishment of maintenance control centers (MCC's) at Airway Facilities Sectors. These facilities will receive hardware and software for a maintenance control center.

Benefits: The MCC'S will enable establishment of uniform functions and operating procedures, and provide the ability to direct and utilize the technical work force effectively.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$38,520.0
FY 1990 Appropriated	---	4,184.7
FY 1991 Request	---	5,200.0
Future Requirement	---	795.3
Total	Various	$48,700.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Regionally Established Maintenance Control Centers	Various	$5,200.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5b(10) Fiscal Year 1991 NAS Plan: VI-16

Program Title: Purchase Land or Easement for Existing Facilities

Amount: $3,000,000 Locations: Various

Basis for Request: The FAA analyzes each land lease to determine if it is in the best interest of the Government to continue to lease or purchase permanent real estate rights. Land rights are purchased if it is cost effective and in the best interest of the government.

Description of Problem: The FAA has been experiencing escalating land rentals, particularly in areas that are undergoing urban development. Land costs and land rentals have been increasing faster than inflation in these areas. The land rentals are paid from the Operations appropriation of the FAA. It is expected that this portion of the budget will dramatically increase over the next five years unless action is taken to acquire permanent land rights. Analyses of each listed site indicate that the net present value cost of leasing the site is greater than the present cost of purchasing the site.

Description of Solution: Provide $3,000,000 to purchase permanent real estate rights for sites which economically qualify for purchase. This funding will reduce land rental costs under the Operations appropriation and will eliminate high relocation costs.

Benefits: The purchase of these sites ensures continued operation of the facility at a particular site. It avoids the expensive costs of relocating the sites and the associated costs of publicly notifying airmen of these relocations. Also, it avoids payment of future rentals at locations that have long-term occupancy potential.

APPROPRIATIONS SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$43,077.7
FY 1990 Appropriated	---	2,953.9
FY 1991 Request	---	3,000.0
Future Requirement	---	a/
Total	Various	$49,031.6

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Regional Facility Site Locations	Various	$3,000.0

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a/ Future requirements will be based on local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5b(11)   Fiscal Year 1991   NAS Plan: VII-4

Program Title: Automated Documentation Development and Maintenance (ADDM)

Amount: $1,900,000   Locations: Various

Basis for Request: The Automated Documentation Development and Maintenance System will provide management and coordination support to the NAS modernization program. The system will provide the foundation to develop and maintain documentation required to implement the projects identified in the NAS Plan and the tools to improve significantly workforce utilization and productivity by consolidating and streamlining numerous fragmented, labor intensive tasks.

Description of Problem: Technical documentation is the foundation that supports a structured configuration management program and it is the key source in any major engineering project. The FAA spends approximately $20 million annually on the development, maintenance, and distribution of technical documentation of all types; this is likely to increase dramatically due to the implementation of the NAS Plan. While the cost of these processes is increasing, the quality of the documentation and the timely access by the user are deteriorating rapidly.

Description of Solution: The Automated Documentation Development and Maintenance System will consist of a two-phase implementation plan. Phase I begins with a scaled down version of the full system and will be located in the Aeronautical Center (AAC), the Central Region (ACE), Central Region's four sector offices, and the Kansas City Air Route Traffic Control Center. The AAC system will continue hardware, operating system database, and management indexing software, connected directly to the Central Region regional office. The regional station, in addition to communication with the AAC database, will provide interface to the four sector office workstations and the Kansas City ARTCC. Phase II will implement the remainder of the system by adding workstations to the remaining General NAS Sectors, ARTCCs, and Regional offices, and connect the FAA Technical Center and Headquarters into the network. The document development locations are proposed for Technical Center and Aeronautical Center with remote workstations at other locations as justified.

Benefits: The Automated Document Development Maintenance System will provide current information on documentation available to all FAA users in an on-line database with rapid retrieval of documents, a better facility for the change control process, and a mechanism to accommodate the rapidly changing NAS System while maintaining current information on all its components. Reductions in: printing and mailing costs, delays in documentation deliveries, time spent seeking data, and wasted paper will be achieved. Compatibility with other existing FAA systems, and system payback within the first year of full implementation will also be realized.

APPROPRIATIONS SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	1,900.0
Future Requirement	---	12,800.0
Total	Various	$14,700.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
ADDM	Various	$1,900.0

Budget Item No: 5c(1) Fiscal Year 1991 NAS Plan: VI-13

Program Title: Provide System Engineering and Support Services

Amount: $111,000,000 Locations: Various

Basis for Request: The National Airspace System (NAS) Plan specifies the need for a total system approach which will accommodate future demands and technology, improve vital safety services, increase productivity, and constrain costs.

Description of Problem: The services of systems engineering, systems integration, and management support contractors are required to implement the operational equipment, computer programs, procedures, documentation, and activities in support of the NAS Plan goals.

Description of Solution: Provide $111,000,000 to fund FY 1991 activities of a multiyear program to procure necessary expertise in all phases of the NAS Plan implementation, from problem definition and functional analysis through system design, equipment specification, preparation of procurement documentation, proposal evaluation, performance validation, transition planning and implementation, system acceptance and certification, and logistics and training support.

Benefits: Provides technical and management support to FAA project/program managers for the efficient and timely implementation of the National Airspace System Plan. Provides ATC system expertise in specific areas of endeavor on an as-required basis.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$416,000.0
FY 1990 Appropriated	---	107,817.0
FY 1991 Request	---	111,000.0
Future Requirement	---	a/
Total	Various	$634,817.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
1. Centrally Procured SEI Prime Contractor and Support Contractor and Services	---	$89,300.0
2. Centrally Procured ATC System Requirements Contractor (e.g., MITRE)	---	15,000.0
3. Centrally Procured System Engineering Support Contractors (Small Business, 8A)	---	6,700.0
Total	Various	$111,000.0

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a/ Continuing requirement to provide systems engineering and support services at approximately $100 million per year.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5c(2) Fiscal Year 1991 NAS Plan: VI-16

Program Title: Provide Air Navigational Facility/Air Traffic Control System Support

Amount: $7,500,000 Locations: Various

Basis for Request: Expansion of facilities providing essential air traffic services and associated system reliability require technical assistance to support implementation.

Description of Problem: As the air navigation/air traffic control systems are expanded, technical assistance is required to support system implementation. These support functions involve engineering services for: (a) the update or modification of production specifications for equipment procurement; (b) identification of key test equipment and logistics support requirements; (c) system standards for construction and installations; (d) improvements for maintainability and reliability; and (e) design of interface where several programs are involved.

Description of Solution: Provide $7,500,000 for engineering, design, and analysis in order to expedite program completion, correct deficiencies, and provide interface design support during field implementation.

Benefits: The major benefit is the capability to respond effectively to in-house engineering design and analysis problems of an urgent and unexpected nature.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$46,067.4
FY 1990 Appropriated	---	7,877.0
FY 1991 Request	---	7,500.0
Future Requirement	---	a/
Total	Various	$61,444.4

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally Procured Services	Various	$7,500.0

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5c(3) Fiscal Year 1991 NAS Plan: VII-3

Program Title: Mike Monroney Aeronautical Center - Lease

Amount: $8,204,100 Locations: 1

Basis for Request: The Mike Monroney Aeronautical Center provides centralized training and logistical support for the Agency. Primary facilities include the FAA Academy for centralized training and the FAA Depot for warehousing equipment and materials and for centralized repair.

Description of Problem: The Federal Aviation Administration (FAA) and the Oklahoma City Airport Trust (OCAT) have renewed by formal lease an agreement which runs from March 1, 1986, through February 28, 2006, whereby the FAA leases the buildings and lands comprising the Aeronautical Center.

Description of Solution: Provide $8,204,100 for the Aeronautical Center lease for FY 1991.

Benefits: Continued leasing of the Aeronautical Center facilities provides a centrally located warehousing and staging facility for agency project work throughout the country and provides essential training facilities.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$14,659.1
FY 1990 Appropriated	---	7,191.0
FY 1991 Request	---	8,204.1
Future Requirements	---	101,995.9a/
Total	1	$132,050.1

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Aeronautical Center Lease Payment	1	$8,204.1

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a/ There is an estimated contingent liability of approximately $54 million (present value) associated with the FAA's long-term lease of facilities at the Mike Monroney Aeronautical Center, Oklahoma City, Oklahoma. This contingent liability will be funded through this account.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5c(4) Fiscal Year 1991 NAS Plan: VI-16

Program Title: Logistics Support Services

Amount: $6,300,000 Locations: Various

Basis for Request: Additional real estate and contracting workload cannot be accommodated within existing resources.

Description of Problem: The NAS Plan will generate a peak workload for regional logistics divisions over the period FY 1988 through 1993 in the areas of contracting, material management, and real estate acquisition and management.

Description of Solution: Provide $6,300,000 to insure the adequate regional logistical support services in the areas of real estate acquisition and management and contracting are available for the various projects which are in direct support of the NAS Plan. Since this represents peak requirements, funds are required to contract for assistance rather than recruit and terminate federal employees over short periods of time.

Benefits: Adequate real estate acquisition and management support and contract administration will help ensure the timely installation of new NAS Plan facilities and equipment, as well as ensure proper management of our real estate resources.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 8,684.4
FY 1990 Appropriated	---	5,907.8
FY 1991 Request	---	6,300.0
Future Requirement	---	9,715.6
Total	Various	$30,607.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Real Estate Acquisition and Management and Contract Administration	Various	$6,300.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5c(5) Fiscal Year 1991 NAS Plan: VI-16

Program Title: Improve Air Navigational Aids and Air Traffic Control Facilities

Amount: $3,500,000 Locations: Various

Basis for Request: To enhance safety, efficiency, and economy in operation and maintenance of the air traffic control system, various relatively low cost improvements are needed nationwide. These improvements will accommodate operation and maintenance improvements not of a recurring nature.

Description of Problem: Various local and relatively minor improvements, restorations, and alterations must be made to many of the over 22,000 commissioned air navigation and air traffic control facilities located throughout the 50 States. The following improvements are typical: (a) make minor improvements to air traffic control positions in air traffic control towers or air route traffic control centers; (b) raise or relocate air/ground communications antennas to reduce frequency interference; (c) correct fire hazards and improve security; and, (d) correct minor design deficiencies in facilities and equipment.

Description of Solution: Provide $3,500,000 for various improvement projects for which requirements often develop without advance notice and demand immediate action.

Benefits: This is a collection of improvement projects required to keep the national airspace system facilities efficient and up-to-date. The projects are mainly for correction of site specific problems and deficiencies.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$17,059.0
FY 1990 Appropriated	---	2,953.9
FY 1991 Request	---	3,500.0
Future Requirement	---	a/
Total	Various	$23,512.9

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Regional Site Work	Various	$3,500.0

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a/ Future requirements will be based on activity and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5c(6) Fiscal Year 1991 NAS Plan: VI-15

Program Title: Provide Frequency and Spectrum Engineering

Amount: $1,900,000 Locations: Various

Basis for Request: Long-range planning is required to acquire and retain the radio frequency spectrum for aeronautical systems, and to provide spectrum management guidance to agency personnel and to various national/international forums.

Description of Problem: The radio frequency spectrum is a limited resource that faces continually increasing congestion and competition among its users. Careful planning is required to avoid problems with interface, poor propagation, the unavailability of spectrum for particular applications, burdensome regulations, and the inefficient use of the spectrum. Existing and new systems are impacted by frequency allocation tables that will accommodate new systems and changes to existing systems.

Description of Solution: Provide $1,900,000 to: (a) conduct aeronautical band studies to identify interference threshold; (b) provide applications engineering analyses of radio frequency propagation and electromagnetic compatibility; (c) provide criteria for collocating air-to-ground communications facilities; (d) Provide electromagnetic compatibility characterization of the radio frequency environment; (e) provide a handbook for determining radio coverage; and, (f) provide data base and program maintenance for radio frequency assignments.

Benefits: The major benefits are effective management of the radio spectrum, electromagnetic compatibility, and noninterference transitioning of new systems into the National Airspace System.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$5,722.0
FY 1990 Appropriated	---	1,772.3
FY 1991 Request	---	1,900.0
Future Requirement	---	a/
Total	Various	$9,394.3

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally Procured Services	Various	$1,900.0

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a/ Future requirements will be based on activity levels and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5c(7) Fiscal Year 1991 NAS Plan: VIII-70

Program Title: Human Resource Management Plan for NAS Transition/Implementation

Amount: $1,500,000 Locations: Various

Basis for Request: Implementation of the NAS Plan will have a tremendous impact on the FAA work force. New equipment installations and automation of facilities will require retraining and/or relocation of thousands of employees.

Description of Problem: A thorough plan for managing the human resource implications of the NAS Plan implementation needs to be developed. The FAA does not have enough people with the requisite expertise available in the current work force to develop such a plan. Inadequate planning for these aspects of the NAS Plan will lead to inefficiency and low morale.

Description of Solution: Provide $1,500,000 to evaluate the first human resource management plan for NAS transition and implementation. This funding will enable HRM to look beyond implementation of the ISSS segment and include other organizations in the next NAS HRM plan.

Benefits: Proper management of employees is crucial to the ultimate success of the NAS Plan. Planning for the human resource needs of the NAS Plan will result in an environment where employees are properly prepared and organized to operate the equipment installed under the NAS Plan.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	984.6
FY 1991 Request	---	1,500.0
Future Requirement	---	4,000.0
Total	Various	$6,484.6

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
Establish Baseline Plan	Various	$1,500.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5c(8) Fiscal Year 1991 NAS Plan: VI-16

Program Title: Provide Test Equipment, Printed Circuit Board (PCB) Software

Amount: $3,800,000 Locations: Various

Basis for Request: The installation of new solid-state facilities and equipment in the National Airspace System has established a requirement to replace the older tube-type equipment with more accurate and stable test equipment.

Description of Problem: A large percentage of the test equipment currently used in maintaining the national airspace system equipment was designed to be compatible with the tube-type technologies. As more and more of the tube-type equipment is being replaced with solid-state equipment, the ability of the older tube-type test equipment is being exceeded. The newer equipment requires more precision and accuracy in verifying proper operation. The new test equipment must also have the capability and interface which make it compatible with equipment used in a remote maintenance environment.

Description of Solution: Provide $3,800,000 to upgrade the test equipment used in the maintenance of the National Airspace System.

Benefits: Major benefits include: the reduction of high maintenance and repair costs associated with the older test equipment; the new test equipment is phase-lock-loop synthesized and, therefore, more accurate and stable; on-line availability time of test equipment would increase; and, supply support for new equipment is commercially available off-the-shelf.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$16,882.4
FY 1990 Appropriated	---	3,714.6
FY 1991 Request	---	3,800.0
Future Requirement	---	12,264.8
Total	Various	$36,661.8

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Estimated Cost ($000)
Centrally Procured Equipment	Various	$3,800.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5c(9) Fiscal Year 1991 NAS Plan: Planned

Program Title: Dynamic Ocean Track System Integration (DOTS)

Amount: $285,000 Locations: Various

Basis for Request: DOTS is a system of related technologies that identifies optimum routes and advises individual flights of the best options available considering weather and existing traffic. Other functions are aircraft performance modeling, communications processing, dynamic weather updating, and traffic display. AAT has requested that testing of the DOTS functions be expanded to include oceanic areas managed by Oakland, New York, and Anchorage Centers, including as soon as possible installation of the traffic display function.

Description of Problem: Integration of DOTS functions in oceanic ARTCCs is planned through the enhanced traffic management system (ETMS) and oceanic display and planning system (ODAPS). Modifications, including compatible computers, networking equipment, and other interfacing hardware are required but are not funded through the existing ETMS or ODAPS programs.

Description of Solution: Install workstations networking systems in Oakland Center, Anchorage Center, and New York Center. Integrate with ETMS and ODAPS. Establish communications between DOTS oceanic control computers.

Benefits: Interfacing between DOTS computers and other oceanic functions and domestic flow control will provide efficient, coordinated traffic flow.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	285.0
Future Requirement	---	1,250.0
Total	Various	$1,535.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Workstations	Estimated Cost ($000)
Installation of Workstations Networking Systems in ARTCC's	Various	$285.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5c(10) Fiscal Year 1991 NAS Plan: VII - (Planned)

Program Title: Contract Support for Advanced Design and Management Control

Amount: $3,984,000 Locations: Various

Basis for Request: The FAA is strengthening its oversight of the major acquisition programs of the NAS Plan, including more strict control of changes and allocation of funds.

Description of Problem: Specialized technical contractor assistance is required to support the functions of the Associate Administrator for Advanced Design and Management Control in providing an independent assessment of NAS Program Activities. This responsibility includes: (1) conducting independent detailed review of selected NAS change proposals (NCP); (2) reviewing and analyzing change control board documentation and procedures; (3) reviewing NAS subsystem functional and performance specifications and associated costs, schedules, and benefits; (4) developing and maintaining a management control information system to support project analysis, evaluations, and recommendations for changes; (5) reviewing, analyzing and providing independent assessment of selected NAS Plan projects; and (6) providing an independent review, monitoring, and evaluation of NAS development programs.

Description of Solution: Provide $3,984,000 for technical and analytical support in order to continue evaluation and oversight of major NAS products and to ensure effective acquisition and implementation of new systems.

Benefits: Management and control of projects to improve effectiveness, efficiency, and safety of the air traffic control system will be strengthened, more effective use will be made of resources, and earlier beneficial application will be made of new technologies.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	5,885.7
FY 1991 Request	---	3,984.0
Future Requirement	---	33,300.0 a/
Total	Various	$43,169.7

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
NAS Oversight	---	$3,984.0

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a/ Continuing requirement to provide NAS oversight support services at approximately $6 million per year.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5c(11) Fiscal Year 1991 NAS Plan: VI-16

Program Title: Independent Operational Test and Evaluation Support

Amount: $4,000,000 Locations: Various

Basis for Request: Operational test and evaluation is a requirement for all acquisitions of new systems or equipment to ensure that they are operationally usable and meet all operational requirements. Independent oversight of this function ensures that planning is adequate, tests are designed to cover and measure all operational features, and that all results are objectively reviewed and carefully considered.

Description of Problem: Prior to a production commitment, a developed system must be installed at a realistic test bed to demonstrate its technical and operational performance, including interface with other system elements. DOT Order 4200.4B, Major Systems Acquisition Review and Approval, as implemented by FAA Order 1810.2, require an independent assessment. Since any additional testing by an independent group is redundant, costly, and could cause extensive delays to system implementation, the concept of IOT&E oversight was developed. The IOT&E staff performs this function and reports to the Administrator through the Executive Director for System Development. The Administrator has extended the IOT&E oversight function beyond production commitment for those programs on which IOT&E oversight was not conducted before production commitment and for other programs where an abbreviated acquisition process is undertaken. If oversight is not performed, it may compromise system effectiveness as well as delay NAS Plan objectives. Operational readiness may not be achieved. Recently the IOT&E Division was given the same responsibility for selected other FAA programs.

Description of Solution: For each major system acquisition, the IOT&E testing will assess compliance with the system requirements statement. Issues will be examined carefully and identified in an operational baseline. Issues addressed in IOT&E may be categorized as software, hardware, system, or human/machine/resource relationship. The IOT&E will focus on those issues. The extent to which automation increases safety and effectiveness depends on how well all of these considerations are integrated in the system. From the results of the IOT&E, the operational readiness of the system will be assessed and reported to the Administrator.

Benefits: The IOT&E function will ensure that requirements are met, ensure that systems are ready for implementation, and minimize errors in field testing.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 3,417.0
FY 1990 Appropriated	---	1,440.0
FY 1991 Request	---	4,000.0
Future Requirement	---	18,042.0 a/
Total	Various	$26,899.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
Analysis of Major Systems	Various	$4,000.0

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a/ Continuing requirement to provide Independent Operational Test and Evaluation Support services at approximately $4.5 million per year.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5c(12) Fiscal Year 1991 NAS Plan: VII Planned

Program Title: Hazardous Materials Management

Amount: $15,000,000 Locations: 63

Basis for Request: As a Federal agency, the FAA is required by law to investigate and clean-up potential hazardous waste sites. The clean-up of hazardous waste sites is authorized by the Resource Conservation and Recovery Act of 1976 (RCRA); the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA); Executive Order 12088; and the Superfund Amendments and Reauthorization Act of 1986 (SARA). These Acts establish mandatory compliance schedules for the identification and clean-up of hazardous substances.

Description of Problem: A number of FAA facilities are in noncompliance with existing hazardous waste regulations. Types of hazardous waste generated by the FAA include: fuels, solvents, herbicides, insecticides, transformer oils, polychlorinated biphenyls (PCB's), and radioactive materials. Some major target areas currently identified for a 5-year period for soil and ground-water clean-up include $25.0 million for the Technical Center, $57.0 million for the Alaskan Region, and $9.5 million for the Aeronautical Center. The Alaskan Region and the Aeronautical Center are on the Federal Agency Hazardous Waste Compliance Docket. The FAA Technical Center has been nominated for the National Priorities List (NPL) for remedial action. The NPL listing is a high-profile action by the EPA and carries with it many significant statutory requirements. Because the Agency is still in the early stages of identifying the extent of some of its hazardous waste problems, there is no assurance that these funds will complete the job or that additional contamination will not be discovered.

Description of Solution: Fund $15,000,000 for FAA facilities to complete the mandatory site assessment investigations, pursue remedial action feasibility studies, and fund the NPL requirements for the Technical Center. The remedial action feasibility study process is complex and similar to an Environmental Impact Statement, requiring outside involvement in the decision to pursue an action. Clean-up and removal activities will be performed based on these results.

Benefits: Funding will expedite the clean-up remediation process and allow FAA facilities to achieve compliance with State and Federal hazardous waste regulations. Additionally, the FAA will avoid liability actions which could result from noncompliance with existing regulations.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	25	$ 2,000.0
FY 1990 Appropriated	38	6,892.4
FY 1991 Request	63	15,000.0
Future Requirement	---	68,107.6
Total	Various	$92,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
1. Design and Begin Initial Physical Clean-Up	40	$10,000.0
2. Complete Remedial Investigations	21	4,800.0
3. Compliance with Other Regulatory Requirements	2	200.0
Total	63	$15,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5c(13) Fiscal Year 1991 NAS Plan: Planned

Program Title: Renovation of Airmen and Aircraft Registry Reporting Systems

Amount: $10,000,000 Locations: 1

Basis for Request: The FAA has an important role in assisting law enforcement agencies in certain aspects of drug interdiction; and the current system of registering aircraft, certificating pilots, and processing major aircraft repair and alteration forms requires substantial improvement to adequately support the drug interdiction effort.

Description of Problem: Requirements were established to correct existing deficiencies of the obsolescent systems which are used in the registration and certification process. These systems do not provide a timely disposition of airmen and aircraft data, are not easily accessible by law enforcement agencies, and do not provide the capability for ensuring the authenticity of forms and/or certificates. Replacement of the existing systems with state-of-the-art equipment is necessary.

Description of Solution: Initial development of the improvements required for the Airmen and Aircraft Registry Program is estimated to cost $24,050,000 through FY 1993. Funding in the amount of $4,000,000 was requested during the FY 1990 F&E budget process. Ten million dollars is required during the FY 1991 period to continue the procurement of optical disk systems, and document production equipment.

Benefits: The improved systems of registering aircraft, certificating pilots, and processing major aircraft repair and alteration forms and the increased enforcement of requirements associated with such systems will benefit all users of such systems (including law enforcement officials) and the general public.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	0	$ 0.0
FY 1990 Appropriated	0	3,938.5
FY 1991 Request	0	10,000.0
Future Requirement	0	10,111.5
Total	1	$24,050.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Location/ Quantity	Amount ($000)
Renovation of Airmen and Aircraft Reporting System	1	$10,000.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5c(14)   Fiscal Year 1991   NAS Plan: VI-16

Program Title: Contract Support Services

Amount: $4,600,000   Locations: Various

Basis for Request: Due to the magnitude, nature, and complexity of the National Airspace System (NAS) Plan, additional support is required to effectively and efficiently manage the contracts associated with the Plan.

Description of Problem: The contracting staff cannot provide the production surveillance support and timely contract administrative services through an in-plant presence.

Description of Solution: Provide $4,600,000 of contract support for NAS Plan system contracts for the Acquisition and Material Service. Resident contract liaison offices at designated NAS Plan system contractors' facilities will provide in-plant contract liaison and production surveillance presence for the FAA.

Contract administration officers represent the contracting officer and perform the following functions: monitor progress, compliance, and problems of major contracts; review requests for progress payments; review proposed subcontracts for contracting officer consent; ensure submission of required reports; review and evaluate contractors' proposals and provide comments to assist the contracting officer in negotiations; and assist in obtaining contract interpretations from the contracting officer.

Benefits: There are three major benefits resulting from this support. First, the FAA receives timely and responsive contract administrative and production surveillance support services through an in-plant presence on designated NAS Plan system contracts. There is improved coordination and communication between FAA and NAS Plan system contractor representatives. Finally, the processing time on contract-related matters will be reduced.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	1,969.3
FY 1991 Request	---	4,600.0
Future Requirement	---	a/
Total	Various	$6,569.3

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Amount ($000)
Contract Support Services	Various	$4,600.0

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a/ Future requirements will be based on activity and local situations which are validated on a year-to-year basis.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5c(15) Fiscal Year 1991 NAS Plan: Planned

Program Title: Aviation Safety Analysis System (ASAS)

Amount: $25,200,000 Locations: Various

Basis for Request: This request addresses a critical need within the FAA to use automation to efficiently and effectively manage safety-related data and information processing systems. In order to perform these responsibilities successfully, this automation program requires the development of a comprehensive and integrated automation system which provides a means of accessing the types of data required by the inspector work force and, thereby, improves the agency's ability to perform analyses of aviation safety information.

A 1987 General Accounting Office report "AVIATION SAFETY, Needed Improvements in FAA's Airline Inspection Program Are Underway" May, 1987; Kendrick & Company/Booz Allen & Hamilton "An Independent Assessment: Safe Skies for Tomorrow, Aviation Safety in a Competitive Environment," July, 1988; Aviation Safety Commission Administration "Final Report," April 1988; and "Report of the Secretary's Task Force on Internal Reforms of the Federal Aviation Administration," April, 1988; all determined that access to ASAS information is critical to the success of the Agency's efforts to improve its inspection program and safety mission.

Description of Problem: Present automation hardware and software technology capabilities are inadequate to provide for the capture, dissemination, and analysis of a wide range of safety related data, to improve and enhance the agency's aviation safety missions. Program managers and inspector personnel must use automation tools that are antiquated and obsolete for planning, scheduling, capturing and tracking of ASAS information. Specifically, continued support of the Burrourgh's system is increasingly cost-prohibitive. Maintenance is excessive and replacement parts are mostly limited to cannibalization efforts.

Description of Solution: Funding of $25,200,000 would support maintenance of the current system, substantial system design efforts, as well as the first phase of hardware and software infrastructure requirements for ASAS information management and communication processes and will add significantly to a more efficient and effective management of the agency's resources.

Benefits: This project will allow substantial improvements in the accuracy, commonality, and the sharing of ASAS and other aviation safety-related information. This is necessary for sound management decisions as well as for the ability to conduct timely and meaningful analyses required to improve aviation safety, save lives, reduce property damage, reduce sabotage and hijacking, reduce pilot other airman errors, and prevent airline disasters.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 1,372.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	25,200.0
Future Requirement	---	72,550.0
Total	Various	$99,122.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
Hardware/Software System Design/Maintenance	Various	$25,200.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5c(16) Fiscal Year 1991 NAS Plan: VII-5

Program Title: NAS Management Automation Program a/

Amount: $14,200,000 Location: Various

Basis for Request: This request addresses a critical need within the FAA to use automation to manage NAS Plan-related data and information processing systems efficiently and effectively. In order to perform these responsibilities successfully, this automation program requires the development of a comprehensive and integrated automation system which contains or provides a means of accessing the types of data required by the NAS Plan.

Description of Problem: Present automation technology hardware and software capabilities are inadequate to provide management with access to the information needed to manage the systems effectively in the National Airspace System (NAS). The airway facilities divisions are relegated to using manual systems to facilitate planning, scheduling, and tracking of activities required to implement the program defined in the NAS Plan through the year 2000.

Description of Solution: Provide $14,200,000 to establish the necessary hardware and software infrastructure to support the efficient and cost-effective management of the Agency's resources.

Benefits: Increased management effectiveness and efficiency of the Agency's resources will result with the implementation of an integrated management network. This project will allow improvements in the accuracy, commonality, and therefore, the sharing of information. This is necessary for sound management decisions, as well as the ability to conduct timely and meaningful analysis for the effective implementation and operation of the NAS.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 6,375.0
FY 1990 Appropriated	---	9,846.3
FY 1991 Request	---	14,200.0
Future Requirement	---	40,823.7
Total	Various	$71,245.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations/ Quantity	Estimated Cost ($000)
NAS Plan Management	Various	14,200.0

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a/ This program was entitled "Automated Command and Control Technology" 5B(08) in the FY 1990 F&E Budget.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 5c(17) Fiscal Year 1991 NAS Plan: VIII - Planned

Program Title: Transition Planning, Engineering and Coordination of NAS Programs

Amount: $3,000,000 Location: Various

Basis for Request: FAA must assure that the equipment and systems being delivered by the acquisition process are transitioned into the operational environment as smoothly as possible. To accomplish this there is an urgent need for development of implementation plans for both the National and Regional Levels. The emphasis for this planning must be placed upon operational procedures, human relations, staffing, training, logistic support and other programmatic areas which must be addressed.

Description of Problem: To achieve successful NAS Implementation, transition plans for technical systems for each project by facility, must be developed. Plans for software integration, human resources, operational procedures, logistics support and FAA-DOD transition must be developed. Review and guidance for each NAS project implementation plan must be provided to the regions. Identification, coordination and resolution of significant NAS integration issues must be continued; transition engineering studies and assessments to guide management decisions on NAS integration problems must be continued; and NAS schedule assessments, interrelationship and program impacts must be maintained.

Description of Solution: Provide funding in the amount of $3,000,000 for regional transition planning, transition engineering, and regional implementation, integration, and coordination of NAS programs.

Benefits: Implementation of NAS transition planning is critical to timely identification and resolution of integration and implementation issues for the large numbers of NAS programs being implemented in the field.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	3,000.0
Future Requirement	---	a/
Total	Various	$3,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
Centrally Procured Services	Various	$3,000.0

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a/ Continuing requirement to provide systems engineering and support services will be determined each year.

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 6a(1) Fiscal Year 1991 NAS Plan: VI-12

Program Title: Procure Long-Range International Flight Inspection Aircraft

Amount: $18,600,000 Aircraft: 1

Basis for Request: Long-range flight inspection requirements in support of Department of Defense, and Department of State in the international aviation environment is inadequately supported by current aircraft.

Description of Problem: The FAA has statutory requirements for performing flight inspection of navigational aids in the international aviation environment. This activity, pursuant to Executive Orders 11161 and 11047, supports the Department of Defense (DOD) flight inspection requirements worldwide as well as Department of State international agreements. Due to the vacillating political climate throughout the world and changes in the locations of United States military activities, it is very difficult for the current fleet of aircraft which supports this activity to provide adequate response for international flight inspection needs. The limited range of the current aircraft assigned to this mission results in delayed response due to requirements for diplomatic clearances prior to overflying other countries' airspace. The urgency of many flight inspection requirements often results in aircraft and crewmembers operating in conflict with standard operating practices for fuel remaining requirements, and cancellation of missions at midpoint are not uncommon due to decisions based on range limitations. As these international requirements continue to increase, further derogation of FAA capabilities to provide this support is imminent unless adequate aircraft are acquired. Of the aircraft assigned to flight inspection, the B727 based in Hawaii is twenty-seven years old and the four Saberliners based in Frankfurt, Germany (2), and Tokyo, Japan (2) are also more than 20 years old and have undesirably short range for the mission profiles they must fly.

Description of Solution: Provide $18,600,000 to obtain and equip one used 3500 nautical mile range aircraft for support of the international flight inspection requirements. Four additional aircraft will be required in the outyears. The precise method of acquisition will be decided based on a cost comparison study of the long range international flight inspection function conducted in accordance with OMB Circular A-126, Improving The Management and Use of Government Aircraft. That study is due to be completed in the summer of 1990.

Benefits: The acquisition and equipping of aircraft for the international long-range flight inspection requirements will provide the FAA with adequate aircraft resources to meet these requirements in a timely and safe manner. DOD land and ship based navigational aids which are dependent on this support will experience a minimum of out-of-service time awaiting flight inspection validation. The danger of international terrorist groups and/or foreign entities compromising our defense capabilities due to the current excessive time required for flight inspection will be minimized.

APPROPRIATION SUMMARY

	Aircraft	Amount ($000)
Appropriated (FY 1982-1989)	0	$ 0.0
FY 1990 Appropriated	0	0.0
FY 1991 Request	1	18,600.0
Future Requirement	4	87,400.0
Total	5	$106,000.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Aircraft	Estimated Cost ($000)
Acquire and Equip Long-Range (3500 NM) Flight Inspection Aircraft	1	$18,600.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 6a(2) Fiscal Year 1991 NAS Plan: VI-12

Program Title: Upgrade Flight Inspection B-727 Aircraft

Amount: $2,795,000 System: 1

Basis for Request: The flight inspection B-727 aircraft requires upgrading of avionics and flight systems to state-of-the-art status.

Description of Problem: The current cockpit configuration in this aircraft includes an outdated electromechanical flight data system and analog autopilot system which are not capable of continuing the level of service currently provided in addition to providing service for new NAVAIDS being added to the NAS.

Description of Solution: Provide $2,795,000 for the upgrade of existing flight data and autopilot systems with dual data electronic flight instrumentation system, flight management system, integrated performance management system, and advanced avionics. This upgrading will provide the capability to interface flight inspection avionic systems for support of advanced systems such as MLS, LORAN-C, and GPS.

Benefits: This upgrade will enable the Pacific/Asian flight inspection program to keep pace with the proliferation of advanced navigational systems developed in support of the NAS and civil/military requirements. Failure to upgrade this aircraft will result in a serious deterioration of flight inspection capabilities in this area.

APPROPRIATION SUMMARY

	System	Amount ($000)
Appropriated (FY 1982-1989)	0	$ 0.0
FY 1990 Appropriated	0	0.0
FY 1991 Request	1	2,795.0
Future Requirement	0	0.0
Total	1	$2,795.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	System	Estimated Cost ($000)
Upgrade Avionics Flight Inspection B-727	1	$2,795.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 6a(3) Fiscal Year 1991 NAS Plan: VI-12

Program Title: Upgrade Flight Inspection CV-580 Aircraft

Amount: $3,200,000 System: 1

Basis for Request: Funds were approved during the FY 1988 budget process to begin the upgrading of the existing CV-580's. A requirement exists to upgrade the remaining CV-580 aircraft avionic components.

Description of Problem: To continue the level of service being provided, in addition to providing service for new NAVAIDS planned for the NAS, such as MLS, LORAN-C, and GPS. Agency aircraft must have their avionic flight inspection systems upgraded. This upgrading will enable compatibility of equipment and permit the same type, caliber, and productivity that is available on the new light, twin-engine turboprops.

Description of Solution: Provide $3,200,000 for flight inspection avionic upgrade and enhancements on the remaining CV-580 flight inspection aircraft.

Benefits: This upgrade will provide a mission-ready aircraft equipped with state-of-the-art avionics systems which is compatible with the remainder of the CV-580 fleet for logistics and maintenance.

APPROPRIATION SUMMARY

	System	Amount ($000)
Appropriated (FY 1982-1989)	2	$6,100.0
FY 1990 Appropriated	0	0.0
FY 1991 Request	1	3,200.0
Future Requirement	0	0.0
Total	3	$9,300.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	System	Estimated Cost ($000)
Upgrade Flight Inspection CV-580 Aircraft	1	$3,200.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 6a(4)   Fiscal Year 1991   NAS Plan: VI-12

Program Title: Procure and Install Marker Beacon Systems

Amount: $470,000   Systems: 40

Basis for Request: Flight inspection aircraft require precision measurement capability during instrument landing system (ILS) commissioning and flight checks.

Description of Problem: The marker beacon receivers currently installed in agency flight inspection aircraft are 1960 vintage analog receivers which are becoming increasingly difficult to maintain (logistics and maintenance) and interface with other instrumentation. Bench and ramp calibrations are unreliable due to inherent drift of output readings which exceed established tolerances for flight inspection work.

Description of Solution: Provide $470,000 to procure and install new digital marker beacon receivers in the agency flight inspection aircraft.

Benefits: The installation of state-of-the-art marker beacon receivers in the agency flight inspection aircraft fleet will provide a reliable airborne ILS component which is easily maintained and affords the precision measurement capability required for flight inspection missions.

APPROPRIATION SUMMARY

	Systems	Amount ($000)
Appropriated (FY 1982-1989)	0	$ 0.0
FY 1990 Appropriated	0	0.0
FY 1991 Request	40	470.0
Future Requirement	0	0.0
Total	40	$470.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Systems	Estimated Cost ($000)
Procure & Install GPS Marker Beacon Systems	40	$470.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 6a(5)   Fiscal Year 1991   NAS Plan: VI-12

Program Title: Procure and Install Cockpit Voice Recorders and Flight Data Recorders

Amount: $2,620,000   Systems: 36

Basis for Request: Congress directed the FAA to develop regulations requiring installation of cockpit voice recorders and flight data recorders in general aviation aircraft which are regulated under Parts 91, 121, and 135 of the Federal Aviation Regulations (FAR).

Description of Problem: The FAA fleet of aircraft is operated in accordance with Part 91 of the FAR, therefore, continued operation in accordance with current directives mandates installation of applicable equipment in the agency fleet of aircraft.

Description of Solution: Provide $2,620,000 for purchase and installation of cockpit voice recorders and flight data recorders in the agency fleet of aircraft.

Benefits: Installation of the required equipment will enable the agency aircraft fleet to maintain compliance with the applicable FAR, provide agency personnel with required training and familiarization with equipment which is in the general aviation fleet, and provide investigators with substantial information not otherwise available in the event of an accident.

APPROPRIATION SUMMARY

	Systems	Amount ($000)
Appropriated (FY 1982-1989)	0	$ 0.0
FY 1990 Appropriated	0	0.0
FY 1991 Request	36	2,620.0
Future Requirement	24	1,800.0
Total	60	$4,420.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Systems	Estimated Cost ($000)
Procure & Install Cockpit Voice & Flight Data Recorders	36	$2,620.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 6c(1) Fiscal Year 1991 NAS Plan: VI-12

Program Title: Upgrade Research and Development CV-580 Aircraft

Amount: $2,200,000 Aircraft: 1

Basis for Request: The Research and Development (R&D) CV-580 aircraft require modernization to adequately provide support for agency programs.

Description of Problem: The current CV-580 aircraft assigned to the R&D program are incapable of meeting requirements for program support due to the outdated avionics and systems installed in the aircraft. These aircraft were scheduled for replacement during the Fleet Conversion Program; however, as a result of deferral of funding for that program, an initiative was developed to begin the upgrade of the two R&D CV-580's during the FY 1990 budget process.

Description of Solution: Provide $2,200,000 for the upgrade of the last R&D CV-580 aircraft. This will permit upgrade of avionics systems to state-of-the-art configuration, and allow refurbishment of the aircraft airframe and wiring configurations to meet mission requirements.

Benefits: The alternative to this solution is the costly acquisition of replacement state-of-the-art aircraft. This solution will provide mission-ready aircraft capable of responding to agency R&D requirements.

APPROPRIATION SUMMARY

	Aircraft	Amount ($000)
Appropriated (FY 1982-1989)	0	$ 0.0
FY 1990 Appropriated	1	2,166.2
FY 1991 Request	1	2,200.0
Future Requirement	0	0.0
Total	2	$4,366.2

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Aircraft	Estimated Cost ($000)
Upgrade R&D CV-580 Aircraft	1	$2,200.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No.: 7a(1) Fiscal Year 1991 NAS Plan: VI-16

Program Title: FAA Technical Center-Technical Building Lease

Amount: $5,290,000 Locations: 1

Basis for Request: To continue current lease agreement with the Atlantic City Improvement Authority.

Description of Problem: In a formal agreement between the Federal Aviation Administration and the Atlantic County Improvement Authority, a 20-year lease/purchase agreement was entered into for building the Center's new Technical Building. The building was completed in 1980 and the annual cost of the lease is $5,290,000.

Description of Solution: Provide $5,290,000 for the Technical Building lease for FY 1991.

Benefits: The Technical Building replaced 36 obsolete and widely dispersed WWII temporary buildings. The new Technical Building provides improved efficiency, lower operating costs, and expanded facilities to meet future R&D needs.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$45,212.0
FY 1990 Appropriated	---	5,290.0
FY 1991 Request	---	5,290.0
Future Requirements	---	42,320.0
Total	1 a/	$98,112.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
Lease Payment	1	$5,290.0

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a/ All work/services to be performed at Federal Aviation Administration Technical Center (ACT).

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No.: 7a(2) Fiscal Year 1991 NAS Plan: VI-16

Program Title: Utility Plant Modifications

Amount: $1,800,000 Locations: 1

Basis for Request: The FAA owns and operates a Central Utilities Plant which includes three refrigeration machines and an electrical distribution system. The FAA also owns and operates an exterior water distribution system. All of these facilities are operated in support of the Technical Center.

Description of Problem: One of the refrigeration machines is approximately 20 years old and in poor condition. One of the two remaining refrigeration machines must remain in operation year round in support of computer equipment. A large portion of the exterior water distribution system is in excess of 40 years old. A number of major electrical devices in the utilities plant require upgrading.

Description of Solution: Provide $1,800,000 to replace one refrigeration machine, provide a free cooling system, replace a portion of the existing water distribution system, and upgrade a portion of the existing electrical system.

Benefits: The modifications will ensure the controlled reliable operation of the Technical Center by replacing aged mechanical and electrical equipment before serious problems occur. The work will also save energy through the provision of free winter cooling and state-of-the-art mechanical and electrical equipment.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 1,800.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	1,800.0
Future Requirement	---	25,000.0
Total	1 a/	$28,600.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
1. Replace one Refrigeration Machine and provide Free Cooling	---	$1,050.0
2. Modify Electrical System and Replace Water Lines	---	750.0
Total	1	$1,800.0

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a/ All work/services to be performed at Federal Aviation Administration Technical Center (ACT).

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No.: 7a(3) Fiscal Year 1991 NAS Plan: VI-18

Program Title: Turbine Rotor Burst Test Facility

Amount: $400,000 Locations: 1

Basis for Request: The Office of Aviation Standards and the New England Region Aircraft Certification Division are responsible for enforcement of the Federal Aviation Administration (FAA) regulations pertaining to containment of turbine engine rotating components. A requirement exists to establish the correlation between component testing and full-scale validation to minimize the costs and to maximize the quality of certification data.

Description of Problem: Uncontained turbine engine rotor failures continue to occur in operational service. The FAA must establish the means to understand the cause of these uncontainments for existing equipment and to develop the capability to evaluate new designs or design revisions to contain component failures. This process is a major element in the development and certification process.

Description of Solution: Provide $400,000 to initiate a facility to permit the conduct of horizontal turbine engine rotor bursts. This facility would enable the FAA to ascertain whether the vertical spin pit tests conducted by the engine manufacturers provide the required level of protection needed when the engine is operated in its normal horizontal position for thrust. The FAA currently has an ideal location at its Technical Center which, when equipped with the elements of this rotor burst facility; namely the specialized test chamber, installation preparation area, and rotor drive and data acquisition systems, high speed photographic instrumentation, and personnel protection; will enable safe, efficient conduct of the needed tests.

Benefits: This project will enable FAA to meet commitments for assuring improved technology in turbine rotor system durability, fault prediction, and hazards prevention.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	400.0
Future Requirements	---	700.0
Total	1 a/	$1,100.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
Design and Procure Equipment and Services	1	$400.0

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a/ All work/services to be performed at Federal Aviation Administration Technical center (ACT).

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No.: 7a(4)   Fiscal Year 1991   NAS Plan: VI-16

Program Title: General Airport Improvements

Amount: $1,300,000   Locations: 1

Basis for Request: The FAA owns and operates the Atlantic City Airport. The Airport handles flight test support of FAA technical project work in addition to providing facilities to military, commuter, commercial airline, and general aviation aircraft using the Atlantic City Municipal Terminal.

Description of Problem:

a. Runway and taxiway electrical access panels are now inadequate and obsolete from both a structural standpoint and an aircraft operational standpoint. The result is potential operational hazards to aircraft using the facility.

b. As a result of the various alterations and modifications to the existing airfield geometric layout over the last few years and in response to recent changes to the applicable advisory circular, the existing airfield directional signage system (both runway and taxiway guidance signs) have become obsolete. Furthermore, major portions of the system are very old and are nearing the end of their useful lives. The continuing deterioration of the system as a whole is contributing to the development of an ongoing and growing operational hazard and maintenance problem.

c. The existing pavements which make up both the remaining part of runway 17-35 and taxiway "F", both of which have been used as access taxiways between runway 13-31 and its parallel taxiway "B", have deteriorated beyond their useful lives. The deterioration is so great that it has forced closure of these access points to aircraft operations. The restricted ability to remove aircraft from the active runway surface creates a potential operational safety hazard.

Description of Solution:

a. Rehabilitation of the existing electrical access panels to improve both their load carrying capacity and jet blast resistance will eliminate the aircraft operational hazards which now exist.

b. A complete redesign of the taxiway guidance sign system, to include new fixtures, signage layouts, and power distribution modifications will improve aircraft operational safety as well as remove many existing airfield obstructional hazards.

c. Construction of a new connecting taxiway, to be designated "E" would improve aircraft operational safety, provide more efficient traffic flow, and fall in line with anticipated master plan development.

Benefits: The elimination of operational safety hazards.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$11,040.4
FY 1990 Appropriated	---	1,181.6
FY 1991 Requested	---	1,300.0
Future Requirement	---	10,800.0
Total	1 a/	$24,322.0

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a/ All work to be performed at the Federal Aviation Administration Technical Center (ACT).

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
1. Replace Elec. Access Panels R/W 13-31, T/W B	---	$ 500.0
2. T/W Signage Upgrade	---	200.0
3. Construct New Stub T/W B	---	600.0
Total	1	$1,300.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No.: 7b(1)   Fiscal Year 1991   NAS Plan: VI-17

Program Title: NAS Modernization of System Support Laboratory

Amount: $4,700,000   Locations: 1

Basis for Request: To establish laboratory environments required to support the testing, integration, and implementation activities associated with National Airspace System (NAS) plan deliverables scheduled for the FAA Technical Center.

Description of Problem: The NAS Plan identifies delivery of 60-100 sector suites and several computer systems as part of the NAS Modernization Program. Approximately 20,000 square feet of laboratory space will require reconfiguration in stages to install a number of separate laboratories and computer complexes.

Description of Solution: To accommodate new systems and equipment, the Technical Center must redesign and reconstruct the laboratory environments. A Technical Center Transition Plan, ATC-86-1165 identifies in detail the multitude of site preparation activities currently planned from the year 1991. The new systems expected to be implemented, integrated and interfaced into the Systems Support Laboratories beginning in the 1991 time frame include: Host initial sector suite system (ISSS), advanced automation system (AAS), job shop, facility and simulation control cystem, common consoles, common console simulators, local communication network (LCN) tower control computer complex (TCCC), terminal advanced automation system (TAAS) and area control computer complex (ACCC). Accommodations for these systems require the relocation of major systems used for ongoing field support which include: Host control support/software development (CS/SD) system, stand alone assembly (SAAS), and the automated flight service system. Extensive modification to existing laboratory environment space as well as expansion of the current system support facility will be necessary. An additional 10,000 sq. ft. of laboratory space is required beyond that available in the current system support facility (red brick building). This space will be required in the mid 1992 time frame to accommodate the current advanced automation system (AAS) equipment delivery schedule. Building #28 will be extensively modified to provide the required space and to accommodate the relocation of flight service station system support facility. The accomplishment of the NAS Laboratory modernization will ensure that NAS Plan systems and equipment can be successfully implemented, tested, and integrated in the NAS System.

Benefits: The establishment of the latest state-of-the-art laboratory environment to support the implementation, testing and integration of new NAS System prior to their delivery to the various FAA field sites.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 6,400.0
FY 1990 Appropriated	---	3,052.4
FY 1991 Request	---	4,700.0
Future Requirements	---	22,500.0
Total	1 a/	$36,652.4

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a/ All work/services to be performed at Federal Aviation Administration Technical Center (ACT).

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
Reconfigure and Relocate Existing System Support Lab and Interface New System into the Lab Environment	1	$4,700.0

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 7b(2)　　Fiscal Year 1991　　NAS Plan: VI-18

Program Title: Establishment of Technical Center Research and Development Laboratory

Amount: $2,000,000　　Locations: 1

Basis for Request: The emerging technologies slated to support the NAS involve advanced air traffic control concepts, procedures, and functions which can not be adequately designed, developed, and/or evaluated using existing simulation facilities.

Description of Problem: The development and investigation of new concepts of air traffic control require a flexible, multi-level simulation laboratory. Existing simulation facilities are inherently difficult to reconfigure, hard to reprogram, and do not possess the capacity to support the study of the validity, operational effectiveness, or controller impact of advanced ATC concepts, functions, and procedures.

Description of Solution: The requested $2,000,000 will be used to continue the establishment of two R&D facilities; a NASPAC (National Airspace System Performance Analysis Capability) development facility and an ATC Human Factors Laboratory. The funding will support the design, procurement, and installation of the hardware and software necessary for the rapid prototyping, development, and evaluation of NASPAC and other new ATC concepts.

Benefits: The flexibility of ATC display and data entry options available in the Laboratory will allow the Technical Center to demonstrate and experimentally evaluate a wide range of human factors issues associated with the introduction of advanced automation without expensive hardware/software modifications or development. The NASPAC facility will make it possible for the FAA to exercise the unique capabilities of the NASPAC model to measure the effects of demand and capacity changes at specific airports and/or enroute sectors upon the NAS as a whole.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	$ 0.0
FY 1990 Appropriated	---	1,969.3
FY 1991 Request	---	2,000.0
Future Requirement	---	11,000.0
Total	1 a/	$14,969.3

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
Facility Development	1	$2,000.0

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a/ All work/services to be performed at the FAA Technical Center (ACT).

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 7b(3) Fiscal Year 1991 NAS Plan: VI-18

Program Title: Special Component Evaluation System

Amount: $550,000 Locations: 1

Basis for Request: New transport aircraft are incorporating state-of-the-art fuel system concepts which provide improved thrust management and fuel scheduling/metering for all engine operating conditions. New technology fuel system components are used in these systems. Criteria must be developed to assist the regions in determining the adequacy of the current certification procedures for these new fuel systems.

Description of Problem: There exists a gap in the capabilities of the Engine/Fuel Test Complex at the FAA Technical Center for fuel system component tests. On certain past projects, testing of components have utilized alternate methods not specifically suited for the purpose, resulting in numerous project compromises.

Description of Solution: Provide $550,000 for additional equipment to establish an evaluation system for component analysis in the Engine/Fuel Test Complex.

Benefits: The major benefits will be in the support of the Agency's regulatory action through improved analysis of engine safety measures. This system will provide a means to test fuel system components with varying conditions simulating typical operational parameters. Parameters to be monitored include on-line viscosity, pressure, temperature, flow rate, control transient operations, and engine light-off regime performance. The system will control fuel system components to present flow rates and pressure allowing precision measurements of fuel characteristics of both regular and modified fuel.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989)	---	0.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	$550.0
Future Requirements	---	0.0
Total	1 a/	$550.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost ($000)
Procure and Install Electronic Equipment	1	$550.0

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a/ All work/services to be performed at Federal Aviation Administration Technical Center (ACT).

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Budget Item No: 7b(4)   Fiscal Year 1991   NAS Plan: VI-18

Program Title: Communication System Modernization Program

Amount: $230,000   Locations: 1

Basis for Request: The FAA Technical Center currently operates, maintains and is responsible for security for the communications system required by the Air National Guard, Atlantic City Airport Ground Control, FAA Security, Duty Officer and FAA research project support. These communications are essential to the safe operations of aircraft at this location.

Description of Problem: The support of the above facilities necessitates operation of communication equipment on a 24-hour, 7-day-a week, nonstop basis. In addition, much of the system must operate in the extremes of the environment and under the inevitable abuse inherent in portable equipment. The equipment is old and unreliable, ranging from 30 years to 5 years old.

Description of Solution: The following equipment will prove essential to the continued, reliable operation of the communication systems:

1.	(2)	FM/AM Cross Band Repeaters	$20.0
2.	(25)	Hand Held Portable FM Transceivers	75.0
3.	(20)	Mobile FM Transceivers	60.0
4.	(20)	Service Vehicle Radios	50.0
5.	(1)	Primary Fire/Crash 375 Watt Repeater	10.0
6.	(3)	Time Code Generators	15.0

Benefits: With the replacement of the communications equipment, the FAA Technical Center can meet the requirement of reliable, continuous operation.

APPROPRIATION SUMMARY

	Locations	Amount ($000)
Appropriated (FY 1982-1989):	---	$ 0.0
FY 1990 Appropriated	---	0.0
FY 1991 Request	---	230.0
Future Requirements	---	0.0
Total	1a/	$230.0

COST ESTIMATE OF WORK TO BE FUNDED THIS YEAR

Activity Tasks	Locations	Estimated Cost (000)
Communication System Modernization	1	$230.0

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a/ All work/services to be performed at Federal Aviation Administration Technical Center (ACT).

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Activity 8. Personnel and Related Expenses $124,898,000

Summary Requirements ($000)

	1989	1990	Change	1991
Positions	1,162	1,368	+ 375	1,743
Employment (FTE's)	1,302	1,326	+ 188	1,514
Amount Requested	$78,906	$75,059	+$49,839 a/	$124,898

There are four basic work areas funded by this activity which require direct FAA personnel. The work specialties include: electronics, civil, and mechanical engineers; electronics technicians; quality control specialists; and flight inspection personnel.

The FY 1991 request includes 375 additional full-time permanent positions. NAS Plan implementation has reached the stage where large quantities of new equipment are being deployed in the FAA's regions and significant work is also required to modify and relocate existing equipment to meet systems needs.

FAA also plans to utilize more TSSC manpower over the next several years. The contract started off slowly, as expected, while TSSC personnel were hired and educated about the FAA's business. It also took time to educate FAA personnel about how to utilize the contract resources. TSSC workload is increasing dramatically now and FAA expects to utilize 420 manyears of TSSC work in FY 1991 (348 of actual field work/72 of office work, such as, personnel, procurement or supervision). Plans for future years are: FY 1992 = 510; FY 1993 = 575; FY 1994 through FY 1996 = 600 per year. It would be difficult to utilize these resources any earlier due to the need to hire/train and control an outside workforce that is about 50 percent the size of the existing F&E regional workforce.

FAA needs additional in-house resources since there are many functions that only government employees can accomplish (such as work packages, work releases, final acceptance of work, entering into leases, agreements). FAA employees are needed to have the necessary flexibility to do certain functions and activities. For instance, it is prohibitively expensive to do very small projects by contract--so FAA personnel are used for these. Certain projects, done in a live operational environment, are done by FAA employees that can work odd shifts, control noise, not knock a facility off the air by lack of knowledge.

The mix between FAA employees and contract employees (TSSC) that is recommended is the optimum to accomplish the NAS Plan workload. In addition, the F&E employees will be transitioned into the maintenance workforce as needed and funded through the Operations appropriation when no longer needed for F&E purposes. This will help to solve the serious "pipeline" problem of providing enough well trained system maintenance personnel to maintain the new NAS equipment.

Staffing and related costs distributed below include estimates for all of the appropriate expenses associated with personnel. Travel costs in this appropriation are for field installation crews that are working on facilities and equipment installations, for on-site coordinators that monitor contractor work, for quality assurance inspectors who are monitoring quality control at contractors' plants, and other travel directly related to the program.

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a/ Only 28 percent of the increase is for personnel compensation and benefits. The rest of the increase is for TSSC contract funding which has been shifted into budget activity 8 in FY 1991 for the first time.

The subactivities or functional areas where FAA personnel are employed are:

a. Establishment/Improvement of Facilities	1989	1990	Change	1991
Positions	1,028	1,167	+ 375	1,542
Employment (FTE's)	1,137	1,133	+ 188	1,321
Amount Requested	$70,019	$64,801	+$49,609	$114,410

The establishment of new facilities is generally accomplished by contract. This includes building and construction; the design, manufacture, and delivery of plant and electronic equipment; and equipment installation. FAA employees monitor contractors' efforts to assure compliance with Agency regulations and criteria. Also, Agency personnel make site selections, certificate facility performance, and perform special installation due to the scope, variety, or unique requirements of some projects. FAA personnel are also required for improvement and modernization projects since much of the work is performed in an operating facility and accomplished in a "live environment."

FAA is requesting 375 additional positions and an associated 188 FTE's in FY 1991 to meet the field installation workload associated with the NAS Plan. FY 1991 represents the tenth year of the NAS Plan modernization effort. Essentially all major NAS Plan contracts have been awarded and FY 1991 represents the beginning of several years of heavy equipment deliveries to the field. Not only does this 375 position request cover scheduled deliveries of NAS equipments, but it also represents workload associated with the installation of MODE S's, ASR-9's, and MLS's which have been delayed due to contract programs. These and other NAS Plan slippages have further impacted the FY 1991 field F&E workload.

Significant FY 1991 field workload includes: building modifications and power upgrades to handle VSCS and AAS in the centers; site preparation to begin installing VSCS and AAS consoles; extensive tower modernizations to bring our 20-30 year old towers up to standards in preparation for AAS; continued installations of instrument landing system, ASR-9's, RCE equipment, and visual NAVAIDS; and test support at the FAA Technical Center to insure projects are ready for field deployment. Of the 118 NAS Plan projects, 27 are getting deliveries to the field by FY 1991. In addition, VSCS and AAS are undergoing production testing at the FAA Technical Center, requiring significant additional workload.

The estimated requirements for this activity includes $29 million for a TSSC support contract. The FAA entered into a Technical Support Services Contract (TSSC) with Raytheon Service Company in August 1988 to provide technical support to supplement in-house airway facilities establishment engineering work forces in their efforts toward implementation of the National Airspace System. The contract is a cost-plus fixed-fee type which will run for five years with two 2-year option periods. The contractor is providing support in site selection, site preparation and equipment installation and testing, as well as such associated activities as drafting, resident engineering, and various OSHA required activities.

b. Flight Inspection	1989	1990	Change	1991
Positions	29	29	-0-	29
Employment (FTE's)	27	28	-0-	28
Amount Requested	$1,566	$1,566	+$59	$1,625

Positions are required to accomplish airborne certification of facility performance. The personnel required in this effort consist of flight crews and maintenance technicians to service flight inspection aircraft. These people participate in site selection for new facilities, flight inspection for commissioning new facilities, and recertifying existing facilities after modification to assure that each facility is operating within specified parameters and that each can be safely utilized.

c. Factory Inspection and Acquisition Activities	1989	1990	Change	1991
Positions	75	125	-0-	125
Employment (FTE's)	110	120	-0-	120
Amount Requested	$5,700	$6,217	+$ 96	$6,313

Quality control specialists are assignec to contractors' plants to review and approve contractors' quality control and reliability programs. They inspect, witness tests, and accept or reject systems, equipment, materials, and services offered by contractors on significant contracts.

d. Aeronautical Center	1989	1990	Change	1991
Positions	30	47	-0-	47
Employment (FTE's)	28	45	-0-	45
Amount Requested	$1,621	$2,475	+$75	$2,550

Personnel perform repair, rehabilitation, and minor fabrication work required in support of the Facilities and Equipment program. Jobs include a variety of shop specialists who repair equipment which can be economically rehabilitated and returned to the field for future use.

Since the inception of the NAS Plan, projects in the Facilities and Equipment budget have been presented, for the most part, under a "full-funding" concept. Under this type of budgeting, all funds required for the completion of a project are requested in the first year. As part of this budgeting process, personnel compensation, benefits, and travel cost are also included for the budget year.

During the planning stages of an F&E project, labor is calculated on a man-hour basis, regardless of whether this work is to be performed by Federal or contract employees. This means that while all labor costs are included in any given project, at the time the budget is sent to the Congress, the agency does not know on which projects Federal employees will work or where contract labor may be required.

The following table displays the new budget authority requested in this budget for personnel compensation, benefits, travel, and related expenses distributed among the various activities. This has been accomplished on a formula basis, taking into consideration those projects which have historically been assigned to FAA employees, as well as projects which require the most travel by Federal employees.

Personnel Compensation, Benefits, Travel, and Related Expenses
by Budget Authority by Activity

Activity	PCB&T
Long Range Radar................	$ 6,895,000
Automation Equipment............	7,594,000
Other Center Facilities.........	13,188,000
Subtotal, Activity 1..........	27,677,000
Terminal Area Radar.............	13,532,000
Terminal Area Automation........	6,741,000
Other Tower Facilities..........	23,827,000
Subtotal, Activity 2..........	44,100,000
Flight Service Stations.........	6,759,000
VORTAC..........................	18,240,000
Low and Medium Frequency Facilities....................	532,000
Instrument and Visual Landing Systems.......................	11,223,000
Subtotal, Activity 4..........	36,754,000
Housing, Utilities, and Miscellaneous.................	14,066,000
Aircraft and Related Equipment..	0
Development, Test, and Evaluation...................	2,301,000
Total...........................	$124,898,000

FACILITIES AND EQUIPMENT
(AIRPORT AND AIRWAY TRUST FUND)

Five-Year Obligation Plan Against FY 1991 New Budget Authority
($ in thousands)

Activity	FY 1991 Request	<----- FY 1991	FY 1992	Total Obligations FY 1993	FY 1994	-----> FY 1995
Long Range Radar................	$ 135,844.6	$ 76,073.0	$ 59,228.0	$ 407.0	$ 136.6	$ 0.0
Automation Equipment............	598,845.0	503,030.0	95,815.0	0.0	0.0	0.0
Other Center Facilities.........	315,362.2	235,260.0	75,687.0	3,156.0	1,259.2	0.0
Subtotal, Activity 1..........	1,050,051.8	814,363.0	230,730.0	3,563.0	1,395.8	0.0
Terminal Area Radar.............	195,522.0	163,847.0	29,915.0	978.0	782.0	0.0
Terminal Area Automation........	170,550.0	134,735.0	35,815.0	0.0	0.0	0.0
Other Tower Facilities..........	333,278.0	247,023.0	81,679.0	2,336.0	2,240.0	0.0
Subtotal, Activity 2..........	699,350.0	545,605.0	147,409.0	3,314.0	3,022.0	0.0
Flight Service Stations.........	83,801.0	46,593.0	35,280.0	1,928.0	0.0	0.0
VORTAC..........................	31,241.0	15,714.0	9,529.0	5,998.0	0.0	0.0
Low and Medium Frequency Facilities....................	2,615.0	1,569.0	785.0	261.0	0.0	0.0
Instrument and Visual Landing Systems.......................	145,515.0	98,077.0	46,565.0	873.0	0.0	0.0
Subtotal, Activity 4..........	179,371.0	115,360.0	56,879.0	7,132.0	0.0	0.0
Housing, Utilities, and Miscellaneous.................	316,373.2	253,099.0	50,620.0	9,491.0	2,531.0	632.2
Aircraft and Related Equipment..	29,885.0	21,517.0	8,368.0	0.0	0.0	0.0
Development, Test, and Evaluation....................	16,270.0	11,226.0	4,718.0	326.0	0.0	0.0
Personnel Compensation, Benefits, and Travel..........	124,898.0	124,898.0	0.0	0.0	0.0	0.0
Total...........................	$2,500,000.0	$1,932,661.0	$534,004.0	$25,754.0	$6,948.8	$632.2

DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

Research, Engineering and Development
(Airport and Airway Trust Fund)

For necessary expenses, not otherwise provided for, for research, engineering, and development, in accordance with the provisions of the Federal Aviation Act [49 U.S.C. 1301-1542] of 1958, amended (49 U.S.C. App. 1301 et seq.), including construction of experimental facilities and acquisition of necessary sites by lease or grant, [$173,000,000] $190,000,000, to be derived from the Airport and Airway Trust Fund and to remain available until expended: Provided, That there may be credited to this appropriation funds received from States, counties, municipalities, other public authorities, and private sources, for expenses incurred for research, engineering, and development[:Provide further, That of the funds available under this head, $1,000,000, to remain available until expended, is appropriated and shall be available for grants under the Federal Grant and Cooperative Agreement Act of 1977 to the National Aviation Institute, Pleasantville, New Jersey, to fund research and development in the area of facilitating research by cataloguing and prioritizing aviation related research efforts and providing a central clearinghouse for aviation research]. (Department of Transportation and Related Agencies Appropriations Act, 1990; additional authorizing legislation to be proposed).

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RESEARCH, ENGINEERING AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Program and Financing (in thousands of dollars)

Identification code 69-8108-0-7-402	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
Direct program:			
00.01 Air traffic control	67,286	113,229	103,746
00 02 Advanced computer	18,247	20,588	19,141
00.03 Navigation	2,444	3,218	3,359
00.04 Aviation weather	14,778	14,642	7,739
00.05 Aviation medicine	4,444	7,112	6,473
00.06 Aircraft safety	25,992	39,529	47,142
00.07 Environment	2,342	1,971	2,400
00.91 Total direct program	135,533	200,289	190,000
01.01 Reimbursable program	1,343	1,393	1,400
10.00 Total obligations	136,876	201,682	191,400
Financing:			
Offsetting collections from:			
11.00 Federal funds	-1,007	-1,050	-1,050
14.00 Non-Federal sources	-336	-350	-350
21.40 Unobligated balance available, start of year	-5,714	-30,126	......
24.40 Unobligated balance available, end of year	30,126	......	......
27.00 Reduction pursuant to P.L. 99-177	......	7	......
39.00 Budget Authority................	159,945	170,163	190,000

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RESEARCH, ENGINEERING AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Financing and Outlays (in thousands of dollars)

Identification code 69-8108-0-7-402	19 89 actual	19 90 estimate	19 91 estimate
40.00 Budget authority (appropriation)	159,945	173,000	190,000
40.00 Reduction pursant to P.L. 101-164 (-)..............	......	-519	......
40.00 Reduction pursuant to P.L. 99-177 (-)...............	......	-2,318	......
43.00 Appropriation (adjusted)........	159,945	170,163	190,000
Relation of obligations to outlays:			
71.00 Obligations incurred, net	135,533	200,282	190,000
72.40 Obligated balance, start of year	110,786	118,756	139,597
74.40 Obligated balance, end of year	-118,756	-139,597	-128,624
90.00 Outlays	127,562	179,441	200,973

RESEARCH, ENGINEERING AND DEVELOPMENT (AIRPORT AND AIRWAY TRUST FUND)

PROGRAM AND PERFORMANCE

The FAA conducts research, engineering and development programs to improve the national air traffic control system by increasing its safety, security, productivity and capacity to meet the expected air traffic demands of the future. The agency also administers aviation medical research aimed at increasing the personal effectiveness and safety of air traffic controllers and the safety of aircrew members.

These programs are conducted by the agency's technical personnel and through contracts with qualified private firms, universities, individuals and other Government agencies. The 1991 request will support a variety of essential aviation-related research efforts, including research into human factors, explosive detection, aging aircraft, and capacity improvements.

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RESEARCH, ENGINEERING AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
OBJECT CLASSIFICATION (in thousands of dollars)

Identification code 69-8108-0-7-402		19 89 actual	19 90 estimate	19 91 estimate
	Direct obligations:			
	Personnel compensation:			
11.1	Full-time permanent	27,847	28,903	30,308
11.3	Other than full-time permanent	1,172	1,210	1,242
11.5	Other personnel compensation	564	582	597
11.8	Special personal services payment	475	491	504
11.9	Total personnel compensation ...	30,058	31,186	32,650
12.1	Personnel benefits: Civilian ...	4,266	4,415	4,634
21.0	Travel and transportation of persons	2,766	2,879	2,468
22.0	Transportation of things	170	177	250
23.2	Rental payments to others	171	178	179
23.3	Communications, utilities, and miscellaneous charges	530	552	537
24.0	Printing and reproduction	4	5	5
25.0	Other Services	92,732	154,633	145,652
26.0	Supplies and materials	1,421	2,572	1,228
31.0	Equipment	3,415	3,692	2,397
99.0	Subtotal, direct obligations ...	135,533	200,289	190,000
99.0	Reimbursable obligations	1,343	1,393	1,400
99.9	Total obligations	136,876	201,682	191,400
	(Memo cost: 21.5)	(Memo cost: 8)	(Memo cost: 8)	RED-5 (Memo cost: 4.5)

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RESEARCH, ENGINEERING AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
PERSONNEL SUMMARY

Identification code 69-8108-0-7-402	19 89 actual	19 90 estimate	19 91 estimate
Direct:			
Total number of full-time permanent positions	645	645	668
Total compensable workyears: Full-time equivalent employment ...	670	673	698
Full-time equivalent of overtime and holiday hours	8	8	8
Reimbursable:			
Total number of full-time permanent positions	6	6	6
Total compensable workyears: Full-time equivalent employment ...	6	6	6

RED-6

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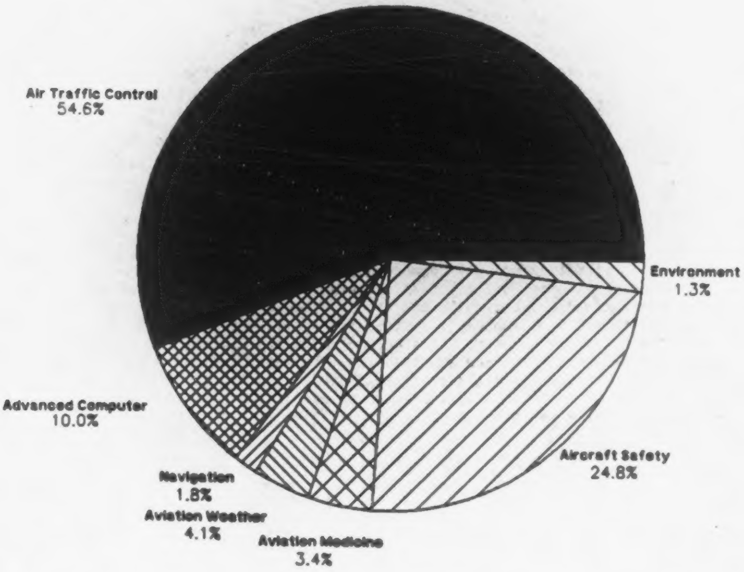
RESEARCH, ENGINEERING AND DEVELOPMENT
(Airport and Airway Trust Fund)
Fiscal Year 1991

General Justification

This request reflects requirements to make air travel safer and more secure and to increase the efficiency and capacity of the national air transportation system. The projects included are consistent with the Research, Engineering and Development (RED) plan. This appropriation has seven (7) budget activities with funds distributed as follows:

Air Traffic Control	$103,746,000
Advanced Automation	19,141,000
Navigation	3,359,000
Aviation Weather	7,739,000
Aviation Medicine	6,473,000
Aircraft Safety	47,142,000
Environment	2,400,000
	$190,000,000

BUDGET BY ACTIVITY



RESEARCH, ENGINEERING AND DEVELOPMENT
(Airport and Airway Trust Fund)
Fiscal Year 1991

The FY 1991 R,E&D budget represents a proactive program to foster new and innovative improvements in the areas of airport security, airport/airway system capacity, advanced air traffic control technology, aging aircraft and human factors.

The thrust of the FY 1991 program is not to wait until there is an accident or incident to identify a research need, but rather to start research programs now that will contribute to the prevention of such accidents or incidents in the future. Similarly, the program is geared not to just catch up with the system capacity shortfall, but to enable us to sustain the expected level of future demand. The greatly expanded focus of the program reflects the input of the aviation community through the annual R,E&D Planning Conference and the R,E&D Advisory Committee created in accordance with the Aviation Safety Research Act of 1988.

FAA performs R,E&D because: the Agency is the sole provider of civil air traffic services in the United States; it has the sole responsibility for the safety certification of all elements of the air transportation system - airports, pilots, other aircrew, aircraft, airlines, mechanics, training schools, repair shops, and aircraft and engine manufacturers; it is the lead civilian agency in the Federal government for bomb detection technology; and, it provides the bridge between the civil aviation sector and related research performed by NASA, DOD, NOAA, and other domestic and international governmental units. The FAA is a key component of an international system of airports and airways that provides direct and indirect employment for millions of U.S. citizens and is one of the few sectors of the U.S. economy that generates a positive trade balance. This preeminence is threatened as the system fails to meet the demands of the American taxpayer in the areas of capacity, safety, security and efficiency and they look to other sources for aircraft, engines, and airline services.

Just as the National Airspace System (NAS) plan of the 1980's was built on the R,E&D that preceded it, it is essential to start now to lay the foundation for the systems to replace the current system beyond the year 2000. System demand is expected to double over the next two decades as the American economy continues to experience economic growth.

The R,E&D program will be accomplished through a number of new and expanded initiatives such as: a National Simulation Laboratory which will enable us to investigate the symbiosis between elements of the NAS system to squeeze the last drop of capacity enhancement from our multi-billion dollar capital investment program and, over the longer term, test and demonstrate the technology for the ATC system of the 21st century; the investigation of new automated air traffic control aids for the terminal environment and the related human factors issue of integrating the controller and pilot into the automated environment of the future; the development of an Explosives Detection Laboratory to test and demonstrate the capabilities of new high technology systems for explosives detection, and the expedited field testing and demonstration of the more promising developments; expanded application of NASA and DOD research into metal fatigue, corrosion and the properties of composite materials into the civil sector to better detect defects and prevent in-flight deterioration of aging aircraft; and, the integration of severe weather detection capabilities into the NAS system.

RESEARCH, ENGINEERING AND DEVELOPMENT
(Airport and Airway Trust Fund)
Fiscal Year 1991

Personnel:

	FY 1990	Increase	FY 1991
Positions	645	+23	668
Full-Time Equivalent - FTP	605	+20	625
Full-Time Equivalent - OTFTP	68	+ 5	73
Total, Full-Time Equivalent	673	+25	698

The success of R,E&D program rests on the ability of the FAA to hire and retain a cadre of highly trained specialists in a variety of science, engineering, computer technology and related disciplines. To that end this program includes some innovative means of working with the academic community to bring people into the field of related aviation sciences and to acquire their skills for the FAA. The program also provides for the enhancement of the skills of existing employees to enable them to stay abreast of the rapidly changing technologies. FAA is requesting an additional 23 positions for FY 1991 to be employed at the Technical Center and the Civil Aeromedical Institute. The increase of 20 FTP FTEs consist of 12 FTEs for the new positions requested and 8 FTEs for increased employment of approved FY 1990 positions.

Program Supervision and Contract Management:

	FY 1990	Increase	FY 1991
Positions	205	-	205
Full-Time Equivalent - FTP	181	+8	189
Full-Time Equivalent - OTFTP	6	-	6
Total, Full-Time Equivalent	187	+8	195

These personnel are responsible for technical direction and program management. They are directly concerned with the dual issues of obtaining the maximum amount of productivity and system efficiency out of today's capital investments and developing the system concepts and components to meet future requirements for increased airport/airway system capacity. The primary function of personnel under this category is to manage major technical efforts falling within their area of technical expertise.

A prime task of personnel under this category is to manage and monitor research and developmental contracts. The contracts cover such subject areas as future automation requirements for air traffic control; human factors as it relates to air traffic controllers, maintenance technicians, air crews, inspectors and others affected by advanced technology; collision avoidance systems; aviation related weather detection; future communication, navigation and surveillance systems; nondestructive testing of aircraft for stress, fatigue, or corrosion damage; and accelerated security efforts in new technology for explosives and weapons detection.

Test and Evaluation:

	FY 1990	Increase	FY 1991
Positions	369	+14	383
Full-Time Equivalent - FTP	360	+ 7	367
Full-Time Equivalent - OTFTP	57	+ 5	62
Total, Full-Time Equivalent	417	+12	429

Personnel, located at the Technical Center, conduct tests and evaluations of projects in all phases of air navigation, air traffic control, airport design and development, communication, weather, aircraft safety and aircraft/airport security. Some typical test and evaluation projects are: flight testing and evaluating the performance of in-flight collision avoidance and navigation systems; testing of new approaches to in-flight fire suppression and prevention; laboratory and field testing of weapons and explosive detection devices; nondestructive testing/inspection of aging aircraft; and test and evaluation

RESEARCH, ENGINEERING AND DEVELOPMENT
(Airport and Airway Trust Fund)
Fiscal Year 1991

An increase of 14 positions have been requested for engineers, scientists and technicians to support the new Explosives Detection Laboratory, to expand the investigation into innovative means of nondestructive inspection of aging aircraft and to provide for enhanced fire safety, crashworthiness and accident survivability research. This facility also employs a significant number of other than full time-permanent (OTFTP) employees who serve as target generators (simulator "pilots") for the air traffic simulators. While this practice uses a significant number of full time equivalent (FTE) positions, it is a cost effective means of staffing an activity that operates on an irregular schedule.

Aeromedical Research:

	FY 1990	Increase	FY 1991
Positions	71	+ 9	80
Full-Time Equivalent - FTP	64	+ 5	69
Full-Time Equivalent - OTFTP	5	-	5
Total, Full-Time Equivalent	69	+ 5	74

The aeromedical research efforts of the agency conducted at the Civil Aeromedical Institute (CAMI) are aimed at understanding and developing means of controlling the biomedical factors that are causes of or contribute to control and/or flight errors and incidents in the system. Their efforts are concerned with flight personnel, air traffic controllers, maintenance personnel, inspection personnel and their work environment. The Aeromedical Research programs cover all the broader aspects of biomedical factors related to the system, including psychology bio-engineering, physiology, pharmacology, biochemistry, and general medicine in order to determine the adverse effects of disease and physiologically-induced deficiencies on the human performance of personnel involved in all facets of air transportation. The Federal Aviation Act of 1958 was amended by the Aviation Safety Research Act of 1988 to strengthen the organizational structure within the agency to enable the agency to respond better to demand for "research on the relationship between human factors and air safety, and on dynamic simulation modeling."

An increase of 9 positions is requested for the addition of Human Factors and Personnel-Organizational Research Psychologists and supporting professional and technical staff to conduct the agency's human factors program. These personnel will research human factors concerns associated with aircrew training and performance, inspection and maintenance of aging aircraft, and the application and adaptation of job task analysis data to the performance of air traffic controller duties.

The justifications that follow are presented in a format by program which includes a history for each program from 1989 and a projection for post-1991 estimated project costs. The aggregated costs beyond 1991 are shown for planning purposes and do not necessarily constitute the outyear budget estimates. At the upper right-hand portion of each separate justification page there is a R,E&D Plan reference number in correlation with Volume II of the Research, Engineering and Development Plan, January 1990.

RESEARCH, ENGINEERING AND DEVELOPMENT
Individual Programs/Program Level/Page Reference

Project	Amount ($000)	Page No.
1. Air Traffic Control		
a. **System**	$14,899	
(1) Future System Definition	$1,046	RED-15
(2) Management and Control Process	3,135	RED-15
(3) R,E&D Plan	564	RED-16
(4) Separation Standards	3,868	RED-16
(5) System Requirements	694	RED-17
(6) System Engineering Management	428	RED-18
(7) Synthetic Vision	1,082	RED-18
(8) National Simulation Laboratory	4,082	RED-19
b. **Beacon**	$ 1,380	
(1) Low-Altitude Communications and Surveillance	250	RED-20
(2) Mode S Integrated Tracker	1,130	RED-20
c. **Aircraft Separation Assurance**	$10,576	
(1) TCAS I Implementation	584	RED-22
TCAS II Commuter Evaluation	491	RED-22
TCAS III Development	2,331	RED-22
TCAS II Implementation	3,234	RED-22
TCAS III Implementation	3,936	RED-22
d. **Communications**	$11,084	
(1) Communication Planning and Design	766	RED-24
(2) VSCS Prime Mission System	1,063	RED-24
(3) NADIN II	230	RED-25
(4) Aeronautical Data Link	9,025	RED-25
e. **System Capacity and Airports**	$33,773	
(1) Airport Pavement	1,905	RED-27
(2) Reduced Runway Occupancy Time	1,545	RED-27
(3) Airport Safety Planning	808	RED-28
(4) Airport Surface Visual Control (Lighting)	1,595	RED-29
(5) Airport Safety Support System	868	RED-29
(6) Terminal/Landside Traffic Modeling	575	RED-30
(7) Capacity Development	2,831	RED-30
(8) Airport Capacity Enhancement Planning	1,138	RED-31
(9) Simulation Model Development and Validation	1,355	RED-31
(10) Precision Runway Monitor - High Data Rate	2,000	RED-32
(11) Wake Vortex Avoidance/Advisory System	1,876	RED-33
(12) Airport Surface Traffic Automation	4,082	RED-33
(13) Terminal Air Traffic Control Automation	7,582	RED-34
(14) Airport Capacity Task Force Studies	2,151	RED-34
(15) National Airspace System Performance Analysis Capability (NASPAC)	2,516	RED-35
(16) Airspace System Models	946	RED-36
f. **Technology**	$ 8,362	
(1) Satellite Applications	3,164	RED-37
(2) ATC Applications of Automatic Dependent Surveillance (ADS)	5,198	RED-38

	Amount ($000)	Page No.
g. **Support**	$7,827	
(1) FAA/NASA Cooperative Programs	$ 1,057	RED-39
(2) Joint University Program	310	RED-39
(3) Program Support	2,864	RED-40
(4) R,E&D Advisory Committee	180	RED-40
(5) Small Business Innovation Research (SBIR) Program	1,000	RED-41
(6) Transportation Research Board (TRB)	200	RED-42
(7) Technology Transfer	960	RED-42
(8) Graduate-Level Research and Education in Aviation Technology (GREAT)	1,256	RED-43
h. **Rotorcraft and Power Lift Vehicles**	$ 4,018	
(1) Rotorcraft/Power Lift Vehicles IFR Operations Evaluatior	1,091	RED-45
(2) Rotorcraft/Power Lift Vehicles Obstruction Avoidance	311	RED-45
(3) Rotorcraft/Power Lift Vehicles ATC Procedures	116	RED-46
(4) Rotorcraft Separation Standards	255	RED-47
(5) Rotorcraft Simulator Standards	157	RED-47
(6) Rotorcraft/Power Lift Vehicles Display, Control Studies and Certification Support	1,047	RED-48
(7) Heliport/Vertiport Design and Planning	1,041	RED-48
i. **Human Systems and Operations**	$10,731	
(1) Information Transfer and Management	982	RED-50
(2) Causal Factors in Accidents and Incidents	1,082	RED-50
(3) Human Factors Applications Support	582	RED-51
(4) Control and Display Technology	882	RED-51
(5) Flight Crew Certfication and Training	2,522	RED-52
(6) Aircraft Automation	1,082	RED-52
(7) Human Performance Assessment and Improvement	982	RED-53
(8) Flight Deck Certification Criteria	482	RED-53
(9) Controller Human Factors	1,471	RED-54
(10) Expert Systems Application to ATC	664	RED-54
j. **Flight Planning Optimization**	$ 1,096	
(1) Dynamic Ocean Track System (DOTS)	846	RED-56
(2) Jet Route and Terminal Area Optimization	250	RED-56
TOTAL, AIR TRAFFIC CONTROL	$103,746	
2. **Advanced Computer**		
a. **Advanced Automation**		
(1) Advanced Automation System Program Management	$ 4,963	RED-58
b. **ATC Automation**		
(1) Advanced Traffic Management System	5,065	RED-59
(2) Automated En Route Air Traffic Control (AERA 3)	8,582	RED-60
(3) Dynamic Special-Use Airspace Management	531	RED-60
TOTAL, ADVANCED COMPUTER	$ 19,141	

	Amount ($000)	Page No.
3. **Navigation**		
a. **Navigation**		
(1) GPS Utilization	$ 1,581	RED-61
(2) Navigation Systems Development	882	RED-61
(3) Navigation Systems Engineering	896	RED-62
TOTAL, NAVIGATION	$ 3,359	
4. **Aviation Weather**		
a. **Aviation Weather**		
(1) Central Weather Processor (CWP)	$ 1,653	RED-64
(2) Icing Forecasting Improvements	982	RED-64
(3) Airborne Windshear Detection and Avoidance	1,041	RED-65
(4) Expanded Low-Level Windshear Alert System (LLWAS)	500	RED-66
(5) Windshear Terminal Information System Integration	641	RED-66
(6) Terminal Weather Radar	2,022	RED-67
(7) Airborne Windshear Advanced Technology	900	RED-67
TOTAL, AVIATION WEATHER	$ 7,739	
5. **Aviation Medicine**		
a. **Aviation Medicine**		
(1) Aeromedical Program Support	$ 656	RED-68
(2) Protection and Survival	2,093	RED-68
(3) Work Force Optimization Research	2,114	RED-69
(4) Human Performance Research	714	RED-70
(5) Aging Aircraft - Human Factors	896	RED-71
TOTAL, AVIATION MEDICINE	$ 6,473	
6. **Aircraft Safety**		
a. **Aircraft Safety**		
(1) Aircraft Systems Fire Safety	$ 5,001	RED-72
(2) Propulsion and Fuel Systems	2,386	RED-73
(3) Structural Crashworthiness/ Airworthiness	3,756	RED-75
(4) Aging Aircraft	5,749	RED-77
(5) Flight Safety/Atmospheric Hazards	3,888	RED-78
(6) Explosives Detection	22,615	RED-79
(7) Weapons Detection	1,899	RED-80
(8) Airport Security	1,249	RED-81
(9) Security Systems Integration	599	RED-81
TOTAL, AIRCRAFT SAFETY	$ 47,142	
7. **Environment**		
a. **Environment**		
(1) Aircraft Engine Emissions	$ 350	RED-83
(2) Aircraft Noise Reduction and Control	2,050	RED-83
TOTAL, ENVIRONMENT	$ 2,400	
TOTAL, R,E&D REQUEST	$190,000	

RESEARCH, ENGINEERING AND DEVELOPMENT (AIRPORT AND AIRWAY TRUST FUND)

Comparative Summary of Appropriations
(Dollars in Thousands)

	FY 1990 Appropriation	FY 1991 Request	Difference
1. Air Traffic Control	$ 92,948	$103,746	$ 10,798
System	15,511	14,899	- 612
Beacon	1,107	1,380	273
Aircraft Separation Assurance	7,359	10,576	3,217
Communications	12,708	11,084	-1,624
System Capacity and Airports	28,725	33,773	5,048
Technology	7,638	8,362	724
Support	5,134	7,827	2,693
Rotorcraft/Power Lift Vehicles	4,109	4,018	-91
Human Systems and Operations	10,542	10,731	189
Flight Planning Optimization	115	1,096	981
2. Advanced Computer	$ 17,778	$ 19,141	$ 1,363
Advanced Automation	7,512	4,963	-2,549
ATC Automation	10,266	14,178	3,912
3. Navigation	$ 2,630	$ 3,359	$ 729
4. Aviation Weather	$ 13,111	$ 7,739	$ -5,372
5. Aviation Medicine	$ 6,450	$ 6,473	$ 23
6. Aircraft Safety	$ 35,276	$ 47,142	$ 11,866
7. Environment	$ 1,970	$ 2,400	$ 430
TOTAL	$170,163 a/	$190,000	$ 19,837

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a/ The 1990 columns reflect the post-sequester enacted level, as adjusted by proposed reprogramming consistent with the reprogramming provisions in the conference report of the FY 1990 DOT Appropriation Act.

RESEARCH, ENGINEERING, AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Fiscal Year 1991

BUDGET ACTIVITY 1: AIR TRAFFIC CONTROL; SUBACTIVITY 1a: SYSTEM

Budget Item No.: 1a(1) R,E&D Plan: 2.6
Program Title: Future System Definition
Amount: $1,046,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	100	421	1,046	14,048

Basis for Request:
The Aviation Industry is expected to continue a high growth rate into the 21st century. The demand for air traffic control (ATC), air navigation and airport capacity and capabilities will expand beyond the capability to handle current plans. The technological advances will allow us to meet these needs with the right combination of airport, airborne and ground systems, people and procedures. This program defines the potential concepts to meet these requirements and use them to develop a definition of the next generation aviation system, define the programs required to develop these concepts and focus the long-term research for the 21st century.

Description of Solution:
A group of aviation community experts will help develop the basic operational concepts to be evaluated. These concepts will be based upon evaluation of the technologies and capabilities expected to be available measured against early estimations of the environment and the problems that need to be addressed. These concepts will be tested and the most promising will be identified for future definition, development and inclusion in the R,E&D Plan and will then be used for defining the future system as a baseline for development. This future system definition will be reviewed and evaluated each year and reexamined on a five-year basis.

Program Request:
In FY 1990, a future system framework and environmental model was developed. In FY 1991, alternative concepts will be evaluated, a proposed future system will be defined, key technologies will be identified, Independent Research and Development (IR&D) will be reviewed and a technology data base will be implemented. New R,E&D projects will be defined and initiated based on the future system definition and existing projects will be modified to better focus on future needs.

Benefits:
More cost effective long-term research program. Results of this program will provide the basis for new R,E&D/F&E programs and changes in procedures for improvements in the aviation system. These will provide significant benefits in airport and airspace capacity, safety, efficiency and security for the National Airspace System.

Budget Item No.: 1a(2) R,E&D Plan: 2.3
Program Title: Management and Control Process
Amount: $3,135,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	1,031	4,563	3,135	17,439

Basis for Request:
Provide visibility, accountability, and control of FAA's Research, Engineering and Development (R,E&D) activities. Develop and set in place a process and systems by which the FAA will monitor and control the R,E&D program and budget to best meet the total needs of the aviation community.

Description of Solution:
Establishment of a configuration management and oversight process for R,E&D programs to provide the necessary controls for requirements review and processing; cost, schedule, and risk control; and management review and oversight. A major part of this process will be an assessment of the necessary capabilities required to define the post-NAS Plan system that will make use of existing and currently maturing technology for the 21st century air traffic control system. A system support contract provides technical and processing support in accomplishment of these functions.

Program Request:
During FY 1989, a draft R,E&D process was completed and periodic reviews of programs initiated. During FY 1990, the process was fully in place with the support contract providing more in-depth analysis of existing and planned R,E&D activities. In FY 1991, the process will continue with more emphasis on developing a systems engineering approach to defining and implementing the research required for the post-NAS Plan air traffic control system.

Benefits:
The products from this program will result in an improved method for management control of R,E&D programs by establishing periodic reviews of requirements and programs. In addition, value will be added to the benefits of R,E&D funding by establishing priorities based on potential benefits to the FAA and user community, cost and technical risk.

Budget Item No: 1a(3) R,E&D Plan: 2.2
Program Title: Research, Engineering and Development Plan
Amount: $564,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	1,742	580	564	2,400

Basis for Request:
Provide an annually updated aviation industry coordinated description of research, engineering and development (R,E&D) activities that will carry the FAA into the 21st century.

Description of Solution:
The plan will document the R,E&D program for the near and long term. A plan will be developed based on the following seven research categories. Aircraft Safety Technology, Capacity and Air Traffic Control Technology, System Security Technology, Human Factors, Atmospheric Environment, Communication, Navigation and Surveillance, and Airport Improvement. It will include recent program accomplishments, highlights of key programs, and a discussion of the relationships of the R,E&D Plan to the National Airspace (NAS) Facilities and Equipment (F&E) Plan as well as related research being conducted by other government agencies, NASA, DOD, NWS, etc.

Program Request:
During FY 1990, the R,E&D Plan was updated using the seven research area concept. In addition, a Congressionally required report on FY 1989 accomplishments was prepared for submittal to Congress with the President's FY 1991 budget. An R,E&D conference was held earlier in the year to allow comments and recommendations from the aviation industry to be incorporated in the R,E&D Plan. In FY 1991, the Plan and report will be updated and a users conference will be held with the emphasis on continuing the renewed and expanded cooperative efforts with the aviation community by actively encouraging their participation in the R,E&D planning process.

Benefits:
Provides a comprehensive aviation coordinated program for R,E&D activities through the 21st century to meet the needs of the agency, the aviation community, and the flying public.

Budget Item No: 1a(4) R,E&D Plan: 3.10
Program Title: Separation Standards
Amount: $3,868,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	3,557	3,719	3,868	14,200

Basis for Request:
This is an ongoing program that provides quantitative guidance for domestic and international decisionmaking concerning adequate minimum safe vertical, lateral, and longitudinal separation standards.

Description of Solution:
Quantitative guidance based on statistical analysis is prepared to support decisionmaking to reduce vertical and horizontal (lateral and longitudinal) separation standards. This activity consists of model development, data collections, data reduction, and analysis. It also includes: (1) the investigation of the effect on separation standards of imposing tighter required navigational performance

specifications, (2) determinations of the effect of tolerating mixtures in the total aircraft population of both old and new specifications, and (3) investigations of the potential for the safe reduction of separation standards in a system with advanced future navigation systems. These analyses include considerations of the role of pilot and controller and their feedback loop process in evaluating navigational performance within the framework of collision risk methodology. This program also provides support in establishing monitoring procedures and safety monitoring.

Program Request:
In FY 1990, work was initiated to develop implementation and monitoring requirements for 1,000-foot vertical minimum separation standards above flight level (FL) 290. These requirements are based on years of data collection and analysis by the United States and many other countries which supports the data package for proposed U.S. rulemaking prepared in FY 1990. In FY 1991, the implementation requirements for 1,000-foot vertical separation will be published, alternative monitoring techniques developed, and testing started. A review and analysis of worldwide guidance material for Area Navigation (RNAV) procedures and separation standards was initiated in FY 1990 and combined with the Required Navigation Performance Capability (RNPC) concept. This RNAV-RNPC review and analysis will continue through FY 1991. This effort supported the International Civil Aviation Organization (ICAO) Review of General Concepts of Separation Panel (RGCSP), North Atlantic Special Planning Group (NATSPG), and other special groups in FY 1990 and this support will continue in FY 1991. This program continually reviews and recommends modifications to separation standards that will benefit safety and efficiency in the airspace.

Benefits:
Safely reduced separation standards provide economic efficiency in both fuel and time saved, increased control flexibility, and increased capacity. Reduced vertical separation has been estimated to save $60 million per year in fuel consumption.

Budget Item No.: 1a(5) R,E&D Plan: 2.1
Program Title: System Requirements
Amount: $694,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	1,296	694	694	5,215

Basis for Request:
Ensure that national airspace system (NAS) requirements are complete, cost-effective, and make the best use of available or foreseeable technology. Gather, evaluate, manage, and control the operational requirements of the NAS. Maintain and update requirements in a single baseline document and develop operational concepts for system functional areas.

Description of Solution:
Analyze requirements of airspace users and the operating services of the FAA in terms of costs, benefits, impacts to the aviation system and users, and technical risks. Validated requirements become a basis for research and development projects or enter the systems engineering process for implementation in the aviation system.
An operational system requirements document (NASSRS) is updated to reflect new or modified requirements. This document details the operational requirements for the aviation system as envisioned in 1995. Specific requirements and supporting analysis will continue to be developed in support of document maintenance and system development and design. NASSRS is the baseline requirements document. Provide an analysis of evolving requirements and available technologies that dictate near-term and long-range enhancements to assure the future safety, productivity, and efficiency of aviation operations.

Program Request:
This is an ongoing activity to analyze NAS requirements, develop operational concepts for meeting these requirements, allocate new and modified requirements to NAS subsystems, identify areas where research and development is required to meet new requirements, and maintain a formal NAS Requirements Specification. During FY 1989, several additional operational concepts including approach and departure sequencing, ground and obstacle avoidance and control outside of independent surveillance coverage were published and agency review initiated on others. During FY 1990, the operational concepts currently in review were finalized. The intent is to complete the required operational concepts for the baseline NASSRS during FY 1991. Supporting analysis of the en route radar requirement started in FY 1989 and was completed in FY 1990.

Benefits:
The products resulting from the requirements identified through this system requirements analysis will result in a more efficient system with improved safety and operations in the NAS. This program also maintains the NAS baseline requirements.

Budget Item No.: 1a(6) R,E&D Plan: 2.4
Program Title: Systems Engineering Management
Amount: $428,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	254	434	428	1,832

Basis for Request:
Provide an administrative and management framework for execution and control of FAA systems engineering projects. Ensure that necessary procedures, information, and training are available for effective management of projects.

Description of Solution:
Evaluate individual project needs and procure appropriate management, training, and support services necessary for the effective administration of projects.

Program Request:
This is an ongoing activity to provide systems engineering management support to the research, engineering and development program.

Benefits:
Provides systems engineering support for R,E&D programs.

Budget Item No.: 1a(7) R,E&D Plan: 3.17
Program Title: Synthetic Vision
Amount: $1,082,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	4,400	4,250	1,082	0

Basis for Request:
Synthetic Vision is an aggressive, multiagency/industry cooperative near-term effort to develop and demonstrate a zero-visibility aircraft landing system based on millimeterwave imaging technology. It is comprised of onboard imaging sensors that will provide the pilot with a synthetic visual representation of the runway environment on a heads-up display during approaches and landings in IFR conditions.

Description of Solution:
Operational requirements were first defined for a range of customers and scenarios. Cost-benefit studies detailed the costs for the added capability and safety for low-visibility operations. The first major contracts developed sensors in brassboard form and documented their performance in measured environmental conditions both on the ground and in the air. Early studies were performed related to the necessary performance for landing the aircraft and issues to be resolved for certification of this new technology. One sensor was selected for further development and integration on an executive-class aircraft.

Program Request:
In FY 1990, technical requirements will be established as a basis for system development. And contracts to begin sensor development will be awarded. Preliminary cost-benefit studies and operational requirements for a Synthetic Vision System will be completed. Certification issues analyses will continue. Flight simulation activity will begin to address the performance aspects of a Synthetic Vision system and the landing footprints of a small aircraft will be documented for pilots using a HUD image of the runway and symbology. A major contract for system development and integration will be initiated. In FY 1991, extensive testing of sensors on an instrumented tower and in aircraft will be conducted and documented. Development of the brassboard sensor into a working prototype Synthetic Vision system will focus on the image enhancement, human factors, and integration issues, as well as the form and fit for an executive-class aircraft. Extensive testing, both static and dynamic, will begin for the evolving prototype sensor and other components. Basic performance requirements will be established, and studies of certification issues will culminate in a recommended methodology for certification.

Benefits:
Synthetic Vision will improve safety by simplifying the complex task faced by pilots of integrating many pieces of vital information necessary for landing an aircraft in today's environment. All the information will be presented in a heads-up way that is easy to interpret. Furthermore, the system will extend aircraft operations in extreme low-ceiling and low-visibility conditions. By presenting a real image of the runway complex, the decision to land safely can be made by the pilot from onboard systems complemented by relatively inexpensive ground navigation and approach aids. The cost for anyone who needs these low-visibility capabilities will be borne by the customers based on their analysis of the cost benefit tradeoffs. Access to airports will be improved in low-visibility conditions without the need to establish and maintain expensive ground navigation and approach aids.

Budget Item No.: 1a(8) R,E&D Plan: 2.15
Program Title: National Simulation Laboratory (NSL)
Amount: $4,082,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	0	850	4,082	57,553

Basis for Request:
This laboratory will be employed to optimize the horizontal integration among individual National Airspace System (NAS) equipment, procedures, and airspace to increase total safety and efficiency toward meeting the demands of the 21st century. Concepts such as the combined use of microwave landing system (MLS), traffic alert and collision avoidance system (TCAS), and high return rate radar to reduce separations and minimums will be tested for feasibility and acceptability to pilots and controllers. As a practical matter, tests cannot be run in a live traffic environment and must be simulated in a realistic environment prior to deployment. The simulation laboratory will also support the more detailed integration of future hardware configurations into the NAS.

Description of Solution:
The FAA will establish a laboratory to test and evaluate proposed future subsystems, aviation procedures, airspace organization, and human factors in an integrated fashion to determine the definition of the 21st century NAS. This will involve using as much of existing and planned Facilities and Equipment (F&E) equipment and system configurations as possible to avoid duplication, control costs, and provide maximum realism. This will provide a means for testing and evaluating alternative concepts for potential future NAS development, and a capability for hands-on development of prototype configuration for future NAS integration.

Program Request:
In FY 1990, the FAA determined the system definition design, and identified alternative system configurations for analysis and evaluation. In FY 1991, the FAA will proceed with an initial capability to demonstrate the synergistic effects of NAS equipment integration in the New York airspace/airport environment. This proof-of-concept definition will demonstrate the high payoffs associated with an operational NSL.

Benefits:
Benefits of the proposed research and development simulation laboratory are increased system capacity and reduced delays. This will be accomplished by simulation, evaluation of new ATC procedures, proposed airspace realignments, and new operational concepts through improved integration of existing and planned NAS facilities. Increased productivity, enhanced safety, and greater system efficiency will result from the use of man-machine interface, with air traffic controllers interacting with simulated presentations of future systems equipment, and revised ATC procedures. Such interactions will help shape the requirements and design of future NAS equipment with the active participation of operational controllers. This should foster favorable field acceptance of new concepts, practices, and facilities. A National Simulation Laboratory will become an integral element of FAA's R,E&D process. This capability will enhance rapid prototyping, reduce implementation costs and improve the overall operation of the NAS by enabling up-front, proof-of-concept testing, integrating human factors feedback with system design decisions, and testing capabilities of new systems prior to final acceptance and field implementation.

RESEARCH, ENGINEERING, AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Fiscal Year 1991

BUDGET ACTIVITY 1: AIR TRAFFIC CONTROL; SUBACTIVITY 1b: BEACON

Budget Item No.: 1b(1) R,E&D Plan: 6.2
Program Title: Low-Altitude Communications and Surveillance
Amount: $250,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	727	100	250	410

Basis for Request:
Provide communications, surveillance and separation services to rotorcraft and fixed-wing aircraft, initially in certain low-altitude and urban areas. Develop all-weather communications and surveillance systems integrated with the national aviation system for all low-altitude, offshore, and remote areas, and provide the basis for low-altitude direct routings.

Description of Solution:
Formulate the functional and operational requirements for low-altitude communication and surveillance systems that will facilitate improved operations, routes, and designs in domestic and offshore airspace. Activities in the initial phase of this project include analyses of rotorcraft operational demographics, air traffic control, and earlier technical studies [e.g., LORAN C Flight Following (LOFF)] to develop low-altitude communications and surveillance system requirements. Cost-benefit analysis will be conducted on the candidate systems that can satisfy these technical requirements. In its second phase, this project will develop the design documents for low-altitude communications and surveillance systems.

Program Request:
In FY 1990, cost-benefit analysis identified cost effective alternatives. In FY 1991, design documentation will be initiated. This effort will provide enhanced safety and airspace capacity for IFR operations conducted in low- altitude airspace based on communications and surveillance services to support these operations.

Benefits:
Enhanced safety and airspace capacity for IFR operations conducted in low- altitude airspace based on communications and surveillance services to support these operations.

Budget Item No.: 1b(2) R,E&D Plan: 6.1
Program Title: Mode S Integrated Tracker
Amount: $1,130,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	814	1,007	1,130	2,270

Basis for Request:
Develop radar data-processing algorithms necessary for new digital radar sensors to integrate with the Advanced Automation System.

Description of Solution:
The new National Airspace System (NAS), Facilities and Equipment (F&E) Plan radar sensors differ from current radar systems in that they provide better positional accuracy and have only digital output. Current radar systems must be upgraded to provide the same capabilities. The project will develop radar-processing algorithms as follows: (1) Establishing a baseline of current system performance for comparison purposes, (2) defining a primary radar tracking system to label and filter radar reports from ASR-9 or similar quality radar systems, (3) defining a system for combining primary radar and beacon surveillance data to produce optimum aircraft tracks, (4) validating the algorithms in this system design using recorded inputs from primary radar and beacon surveillance sensors, and (5) developing the engineering requirement and other documents necessary to specify the algorithms and processors needed to implement this system.

Program Request:
The present ASR-9/Mode S output will not support the necessary timing performance and radar beacon target tagging required by the Advanced Automation System (AAS) specification and Configuration Control Decision (CCD) 8508. This applies only to ASR.9/Mode S Integration. AAS testing activities will require input from a combined

tracker in FY 1991 and AAS implementation will require tracker input from all the ASR-9/Mode S sites. In FY 1989, work was initiated to develop an Integrated Tracker and a Test Bed to support AAS testing. In FY 1990 and FY 1991, this work will continue as well as additional work on supporting technical data and test planning.

Benefits:
Improve ATC system efficiency and reduced ATC system delay due to the combined radar beacom tracking performed at the sensor site.

RESEARCH, ENGINEERING, AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Fiscal Year 1991

BUDGET ACTIVITY 1: AIR TRAFFIC CONTROL; SUBACTIVITY 1c: AIRCRAFT SEPARATION ASSURANCE

Budget Item No.: 1c(1) R,E&D Plan: 9.1
Program Title: Traffic Alert and Collision Avoidance System (TCAS) *
Amount: $10,576,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	14,444	7,359	10,576	19,519

Basis for Request:
Develop and demonstrate a viable ground-independent airborne collision avoidance capability. The aviation community will be provided with the standards and certification guidance materials required for implementation of this capability in support of the National Airspace System (NAS) Plan goal of independent air traffic control (ATC) backup.

Description of Solution:
The TCAS concept comprises three basic system components. TCAS I is a proximity warning system with the ability to indicate the relative position of an intruder on an appropriate cockpit display. The traffic advisory indicates the range, bearing, and, if Mode C equipped, the relative altitude of the intruder aircraft. In addition to traffic advisories, TCAS II provides resolution advisories or recommended avoidance maneuvers for purposes of ensuring safe separation from aircraft on collision or near-collision courses. The resolution advisories that TCAS II displays to flight crews are in the vertical plane (e.g., CLIMB, DO NOT DESCEND). TCAS III equipment is designed to generate traffic and resolution advisories in both the vertical and horizontal planes (e.g., TURN RIGHT, DO NOT TURN LEFT).

Program Request:
The FAA is planning to conduct a TCAS I limited installation program (LIP) to ensure that certification and operational procedures will be available for implementing TCAS I into the NAS in accordance with the FAA TCAS rule. During FY 1989, a turnkey contract was awarded to provide six to twelve TCAS I units for installation, and evaluation on commuter aircraft to support the LIP. Equipment fabrication will be completed in FY 1992. Based on the information on the number and qualifications of potential TCAS I manufacturers obtained during the LIP contract award effort, the FAA will decide whether to undertake a source development and procurement (SDP) program to develop TCAS I manufacturing sources to ensure availability of TCAS I equipment to meet the rule requirements. Under the SDP program, up to 50 TCAS I units will be procured from at least two sources, for installation on FAA and other Government agency aircraft. If required, the contract for these units will be awarded in FY 1992. In support of the TCAS II LIP, the flight evaluation on two Northwest Airlines MD-80's and a United Airlines B737 and DC8 aircraft was completed in FY 1989. During FY 1989, a turnkey contract was awarded to provide four TCAS II units for installation on two commuter aircraft. A six-month flight evaluation was conducted in FY 1990. During FY 1990, studies pertaining to the integration of TCAS II with advanced cockpit displays was completed. In accordance with a Congressional mandate, the FAA will provide technical support during the transition of TCAS II into the NAS. During FY 1990 and FY 1991 airborne TCAS and ground radar recorded data and pilot reports will be used to evaluate the effects of fleetwide TCAS II implementation on ATC and flight operations. Changes to TCAS II design will be incorporated as necessary during this initial implementation period. In response to an air traffic initiative, an extensive study of the use of TCAS II technology to reduce aircraft separation in terminal and oceanic areas to increase system capacity will be conducted. A study plan was prepared in FY 1990 and analytical studies and flight simulations will be performed during FY 1991. Flight testing of version three of the TCAS III collision avoidance algorithms and bearing rate accuracy monitor was conducted and drafts of both the TCAS MOPS and safety study were completed during FY 1990. Studies to upgrade TCAS II production units to the TCAS III level of performance were begun in FY 1989 and completed in FY 1990. The FAA is planning to conduct a TCAS III LIP similar to that conducted for the TCAS II. TCAS II upgrading and MOPS testing will be accomplished and flight testing at the FAA Technical Center will be completed in FY 1991. A six-month airline flight program will begin in FY 1991. During FY 1990 and FY 1991, studies pertaining to the integration of TCAS III with standard and advanced cockpit displays will be performed.

Benefits:
Enhances safety by providing independent aircraft separation back-up to normal air traffic control operations in controlled airspace and for primary separation assurance outside controlled airspace.

RESEARCH, ENGINEERING, AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Fiscal Year 1991

BUDGET ACTIVITY 1: AIR TRAFFIC CONTROL; SUBACTIVITY 1d: COMMUNICATIONS

Budget Item No.: 1d(1) R,E&D Plan: 4.1
Program Title: Communications Planning and Design
Amount: $766,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	758	1,034	766	3,448

Basis for Request:
Develop a framework for FAA communications systems that provides the most cost-effective use of current and emerging technologies and the capability for meeting communications needs into the 21st century. The project will define basic system architecture and requirements.

Description of Solution:
Determine the feasibility, cost, and impact of converting a digital FAA's nearly completed analog microwave system to a digital system with drop-and-insert capability. The impact of digital switching architectures and a low-density user-access network will be examined. If feasible and cost-effective, these technologies will be implemented in the mid-to-late 1990s.

Program Request:
In FY 1989 performed studies to determine which components of the analog system need to be modified or changed to a digital system. In FY 1990, continued these studies and additionally investigated low cost drop-and-insert capabilities for the digital system. In FY 1991, trade-off studies will be performed to determine how to transition from the analog to the digital system and begin specification preparation.

Benefits:
These communication improvements are essential to handle the anticipated growth in aircraft operations projected between now and the 21st century.

Budget Item No: 1d(2) R,E&D Plan: 4.3
Program Title: VSCS Prime Mission System
Amount: $1,063,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	1,537	1,150	1,063	3,420

Basis for Request:
This activity will provide the resources necessary to manage the Voice Switching and Control System (VSCS) program. This program will establish a new switching and control system that will provide voice communications for the initial sector suite systems and the area control facilities for the long term. VSCS will be an integrated air/ground and ground/ground voice communications system that will meet current and future operational and maintenance requirements.

Description of Solution:
The introduction of modern and higher levels of automation to meet the increasing demands for service exceeds the capabilities of the agency's various communications facilities and systems. The Bell 300 voice switching system currently used in the air route traffic control centers is not capable of automatic reconfiguration required by the advanced automation system; is not expandable to meet the need of the sector suite common consoles, much less the terminal radar approach control facility (TRACON) consolidation; and is very old with future reliability in question. The current system must be replaced with a state-of-the-art communication system. The VSCS position equipment will be installed in the existing en route controller workstations to allow for an orderly transition to the sector suites of the advanced automation system. The sector suites can not be commissioned until the VSCS is in place and operating. To successfully implement a large and complex system such as the VSCS requires a disciplined approach to project management and a commitment to provide sufficient resources for the entire spectrum of administrative and engineering management activities.

Program Request:
This request will provide funding for in-house costs associated with managing the VSCS program. During FY 1990, prototype factory acceptance tests were completed and an acquisition contract was awarded for VSCS production and implementation. In FY 1991, a production critical design review will be completed; a prototype upgrade will be delivered to the FAA Technical Center; operational test and evaluation will begin; and, limited production will be authorized.

Benefits:
The VSCS will be based on a design concept that will permit standardization of console equipment, switching system interfaces, and radio control equipment. It will provide a very high level of availability in the support of critical functions while in normal backup, emergency, and failure modes. The design will facilitate maintenance while providing efficient utilization of transmission resources.

Budget Item No.: 1d(3) R,E&D Plan: 4.4
Program Title: National Airspace Data Interchange Network (NADIN)
Amount: $230,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	161	502	230	600

Basis for Request:
Analyze, design, and specify enhancements to NADIN II that will meet the data transfer requirements of the major FAA project functions and facilities in the national airspace system (NAS) Facilities and Equipment (F&E) Plan. As it evolves, NADIN II will provide a cost-effective and integrated common-user data transfer system. The resulting communications system will cost significantly less than alternative network solutions and will substantially reduce the number of dedicated circuits and their associated costs.

Description of Solution:
NADIN II system design is based on data transmission requirements of new systems and consolidation of present systems. This communications utility will be coordinated with other communications initiatives to provide required switching and transmission facilities. NADIN II development involves a two-phase approach, resulting in a single specification that will satisfy both Phase 1 and 2 requirements. Phase 1 will provide packet-switching nodes with virtual circuit and alternate routing capability, centralized network control and monitoring, and additional trunking. Phase 2 will provide the capability for system enhancements, including additional system capacity, connectivity, and interfaces. The standardization of access interfaces and exchange protocols will be specified to ensure future flexibility for system evolution. NADIN II will provide quick-response, interactive data transfer and efficient file and data base transfer capabilities.

Program Request:
During FY 1989, studies were finalized in the assessment of the overall communications requirements of the Advanced Automation System (AAS) in order to determine proper sizing of the NADIN II Phase II Expansion. In FY 1990, funds were used to complete the definition of the technical approach related to the expansion, to perform modeling studies of NADIN II network evolution, and to provide technical assistance in monitoring and evaluating contractor system design. These activities will continue into FY 1991.

Benefits:
Modernization of the communication facilities is required to effectively support the AAS improvements currently underway in the F&E program. These communication improvements are essential to handle the anticipated growth in aircraft operations projected between now and the 21st century.

Budget Item No.: 1d(4) R,E&D Plan: 4.5
Program Title: Aeronautical Data Link
Amount: $9,025,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	11,980	9,025	9,025	40,607

Basis for Request:
Develop data link applications needed to provide users with improved air-ground data communications services to achieve National Airspace System (NAS) Facilities and

Equipment (F&E) Plan goals of higher productivity, increased efficiency, and enhanced safety through error-free communications. This effort will support the creation of the future air traffic control (ATC) environment. Provide the technical development needed to implement the Mode S data link system as an air-ground data communications element within the NAS.

Description of Solution:
Implement air-ground data communications via Mode S data link to meet the following national aviation system objectives: (1) establish a flexible air-ground data communications system to provide communications between NAS elements and properly equipped aircraft and (2) develop applications for the ATC communications system to improve safety of flight. Develop the architecture of the air-ground communications system to conform to the separation of functions specified by the open systems interconnection (OSI) reference model. This will allow applications development independent of the air-ground links used for communications. Protocols will allow the use of multiple air-ground data links. The test bed will help verify the correctness of communications protocols. Protocols to be tested will include both Mode S data link and end-to-end communications functions not specific to Mode S. The test bed will also test the operability of multiple air-ground data links. Developing and evaluating these communications protocols will further the establishment of guidelines and standards for related avionics. This, in turn, will lead to a wider implementation of Mode S data link.

Program Request:
In FY 1989, the Minimum Operational Performance Standards (MOPS) for the Mode S Aircraft Data Link Processor were approved by the Radio Technical Commission for Aeronautics. During this period, operational concepts for ATC data link applications were also developed. These standards and concepts have been incorporated (along with other information) into an Advisory Circular, published in FY 1990, that defines the entire aircraft data link equipment suite. Also, in FY 1990 MODE S data link test beds will be used to verify the communications protocols, the surface communications characteristics and the integration of the data link into avionics and ground system networks. The focus in FY 1991 will be on the development of additional data link services, including windshear alerts, and the coordination of ICAO standards.

Benefits:
Data link is key to realizing future safety, capacity, and efficiency benefits in the NAS. In the near-term, benefits involve transmission of currently available data to pilots; thereby relieving the controller of voice transmissions; i.e., weather information, ATC clearances, windshear alerts. In the longer term, data link is key to the realization of the safety, capacity and efficiency benefits which will become possible when the Advanced Automation System including AERA enhancements is implemented in the late 1990's. At that time automatic transmission of ATC instruction such as en route metering and flow management and airborne flight plan filing and amending will be possible.

RESEARCH, ENGINEERING, AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Fiscal Year 1991

BUDGET ACTIVITY 1: AIR TRAFFIC CONTROL; SUBACTIVITY 1e: SYSTEM CAPACITY AND AIRPORTS

Budget Item No.: 1e(1) R,E&D Plan: 10.1
Program Title: Airport Pavement
Amount: $1,905,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	813	2,080	1,905	9,008

Basis for Request:
Provide support, through research and development, for the rule-making and advisory mission of the FAA in setting minimum acceptable standards for airport pavements. This program concerns the areas of materials quality, design, evaluation, construction and maintenance, that will assure airport pavement integrity and longevity.

Description of Solution:
The agency sponsors research to arrest premature deterioration of pavements and develop new or improved criteria for materials at the request of airport owners, operators and industry groups. Surveys, studies and tests are conducted to determine optimal limits for variables in order to assure improved pavement performance and longevity. Where necessary, laboratory investigations are performed and prototype test pavements are constructed to verify the research findings before recommendations are made for new and improved pavement criteria.

Program Request:
In FY 1990, new quality control and acceptance criteria on portland cement concrete was provided to airport operators to provide incentives for contractors to meet FAA airport pavement specification standards. A study on the use of layered elastic methodology and non-destructive testing for the evaluation of airport pavements serving heavy aircraft was also completed. The results of this study will help airport operators evaluate the strength of existing pavements for heavy aircraft. In FY 1991, the development of new and improved criteria for performance-enhancing devices such as plastic grids, sheets and fibers, and evaluation of plastic wrap as a drainage device for airport pavements will be completed. Criteria for the use of roller-compacted concrete to reduce construction cost of airport pavements, and mechanical methods for reinforcing weak base courses, will be completed. Laboratory studies to validate a unified pavement predictive methodology will be initiated. This effort will provide validation of the methodology before being available to airport owners and operators for application to airport pavements.

Benefits:
Development of state-of-the-art techniques and procedures will assure good performance and longevity of airport pavements in a cost-effective manner. Airport owners and operators will be provided with methods to utilize new materials developed by industry as substitutes for conventional materials that are becoming scarce and increasingly expensive to secure. Downtime of runways, taxiways and aprons will be diminished thereby increasing airport capacity. Large capital outlays for reconstruction and repair of airport pavements will be deferred through more understanding and better application of advanced technologies.

Budget Item No.: 1e(2) R,E&D Plan: 10.3
Program Title: Reduced Runway Occupancy Time (ROT)
Amount: $1,545,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	1,304	1,006	1,545	4,598

Basis for Request:
Improve airport designs to reduce runway occupancy time and taxiing time from runway to gate and back to runway. Improve aircraft ground operations by providing reliable information on runway snow/slush depths and timely snow/ice removal. Improve airport safety zone by providing design criteria for soft-ground overrun systems.

Description of Solution:
Studies will be conducted to improve airport design and configuration to decrease runway occupancy time and decrease the taxiing time from runways to gates and back to runways. Increase in airport capacity is expected from the results of these studies.

Also, current and improved airport design and configuration will be evaluated for compatibility with new aircraft. Improved slush and snow detection and measurement systems with methods to report the conditions to air traffic control (ATC) towers and airport operations will be evaluated. Improved deicing and anti-icing chemicals and abrasives will be evaluated to determine the optimum application rate needed to minimize the downtime for removal operations.

Program Request:
Work on the simulator evaluation of improved runway exits continued in FY 1990. A runway exit design was completed for demonstration at a specific airport in FY 1990. In FY 1991, simulator evaluation of the improved exits will continue, and acceptable designs will be provided for demonstration at additional airports under the Airport/MLS Demonstration Program. Field evaluation of exit design was initiated in FY 1990. The improved exit designs are expected to demonstrate increased capacity at the airports. In FY 1990, work to evaluate the effectiveness of current exit and taxiway systems and improved designs continued. This effort will decrease operating time and increase capacity. Work on slush and snow detection and measurement systems with methods to report the conditions to ATC towers and airport operations offices continued in FY 1990. Both efforts will be completed in FY 1992. An improvement in support management will be a direct result of this project. Also, evaluation of improved deicing and anti-icing chemicals and abrasives continued in FY 1990 and will continue in FY 1991. Development of design criteria for soft-ground arresting systems was initiated in FY 1990 and will be completed for foam in FY 1991. An experimental program to verify the theoretical stopping distances in foam was completed in FY 1990 and will continue for gravel and sand in FY 1991. Analysis of current airport designs for compatibility with new aircraft was initiated in FY 1990 and will be completed in FY 1991. Clearances, fillets, curves, and apron requirements for airports are considered in the work.

Benefits:
Increase airport capacity through reduced ROT and decreased taxiing time. Improve safety by providing arresting systems in overrun areas. Improve airport management in terms of timely removal of snow, slush, and ice.

Budget Item No.: 1e(3) R,E&D Plan: 10.2c
Program Title: Airport Safety Planning
Amount: $808,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	602	663	808	2,972

Basis for Request:
The purpose of this program is to improve airport safety through the positive control of birds and wildlife. This program will develop an analytical model and data base to assist airport planners to assess hazards of birds and wildlife at the airport.

Description of Solution:
The results obtained from the study on the physiological response of birds to various aircraft, along with information from the birdstrike data base and airport environmental data, will be used to develop a computerized Bird Hazard Assessment Model. This model can be used for environmental impact assessments in determining the influences of land use on creating airport bird hazards. In addition, several studies will be conducted to study wildlife and bird hazards at the airport.

Program Request:
In FY 1990, work continued on the physiological response of birds to various aircraft and will be completed in FY 1992 with the development of a Bird Hazard Assessment Model. This model will enable airport planners and operators to predict the probability of bird strike occurrences given the bird density, aircraft frontal area, number of operations and/or frequency of flights through areas of known bird concentration. In FY 1991, three additional studies will be initiated on Bird Hazards/Wastewater Treatment and Solid Waste Disposal, and Airport Landscaping - Wildlife Hazards. These studies, which will be completed in FY 1992, will enhance the data base and improve the accuracy of the Bird Hazard Assessment Model.

Benefits:
Improve airport safety through the positive control of wildlife in the airport environment.

Budget Item No.: 1e(4) R,E&D Plan: 10.2a
Program Title: Airport Surface Visual Control (Lighting)
Amount: $1,595,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	677	1,149	1,595	6,600

Basis for Request:
The purpose of this program is to provide concepts and criteria for improved lighting, marking and signing devices. These concepts and criteria will improve airport safety by providing better guidance in low-visibility conditions.

Description of Solution:
The efforts in this program will be accomplished by developing and testing improved lighting/marking/signing devices for low visibility runway and taxiway guidance. Tests of promising systems and concepts will be initially conducted at the FAA Technical Center. When necessary, improved systems will be validated by field tests at operational airports. Recommendations for incorporation of the improved lights, markings and signs in the Advisory Circular will be developed. Additional studies will be initiated in FY 1991 to further enhance the guidance systems on taxiways.

Program Request:
In FY 1990, the in-service evaluation of the "hold-short" lighting system was completed, as well as the evaluation of a circling guidance system on runway lights. In addition, new studies were initiated for future lighting and marking needs and taxiway caution lights. These efforts will be completed in FY 1991. Recommendations for the development of standards for signs and lights for taxiways, taxiway intersections and runway exits will be completed in FY 1991. The recommended standards for visual aids in different visibility conditions will provide improved signs and lights for capacity improvement demonstration projects. New initiatives that will be undertaken in FY 1991 include studies to further improve taxiway lighting systems and provide lightning protection for airport lighting.

Benefits:
Safe ground operations under all weather conditions through better lighting and marking.

Budget Item No.: 1e(5) R,E&D Plan: 10.2b
Program Title: Airport Safety Support System
Amount: $868,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	356	666	868	3,394

Basis of Request:
To improve the cost-effectiveness of airport rescue and firefighting service. To facilitate aircraft operations on runway exits and to prevent contamination of underground environment.

Description of Solution:
Studies will be conducted on improved firefighting agents and equipment including vehicles for rescue and firefighting. Improved agents include new foams, combinations of agents such as foam and halon, and auxiliary and special purpose agents such as those that emulsify fuels and for fighting magnesium fires. Various types of improved equipment will be considered in the program such as nozzles for dispensing the agents, hand-held cabin penetration devices, and improved, quick response, vehicles. Studies on braking and cornering friction values will be conducted to define the limiting values needed during maneuvering of high-speed exits.

Program Request:
Work on foam, auxiliary and special purpose agents, nozzles, and procedures was completed in FY 1990. The results were made available to airport and airline industry groups to improve safety. Work on the effectiveness of various combinations of firefighting agents will continue in FY 1991. In FY 1990, testing and evaluation of hand-held penetration devices that can penetrate aircraft cabin and introduce agents into the cabin were initiated and will continue in FY 1991. Also, testing and evaluation of improved, quick response firefighting vehicles will be initiated in FY 1991. Measurement of cornering at various tire angles and braking friction values were reinitiated after delayed by higher priority work and continued in FY 1990 and will continue in FY 1991. The friction values will be used to set design limits for runway exits.

Benefits:
Improve airport safety by providing cost-effectiveness firefighting service (improved agents, equipment, and procedures). Improve runway exit operations by providing realistic friction limits. Improve underground environment by providing accurate and reliable fuel leakage sensors.

Budget Item No.: 1e(6) R,E&D Plan: 10.6
Program Title: Terminal/Landside Traffic Modeling
Amount: $575,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	350	325	575	600

Basis for Request:
Develop microcomputer-based simulation models with graphic output for use in modeling throughout airport terminal buildings to alleviate congestion and optimize design.

Description of Solution:
This program will develop a series of simulation models for use in planning airport passenger terminals and ground access. These models will analyze pedestrian flow through terminal areas and related areas as an aid in estimating space and access requirements. Commercial software will be evaluated to determine if it needs agency requirements. Modifications or new software may then be developed.

Program Request:
During FY 1990, the preliminary design of a standard terminal design model was completed. The model will be used by airport planners to identify efficient designs on specific sites. In FY 1991, development of prototype software for the model will be initiated. In addition, work will begin on the evaluation of airport-access models to simulate ground systems, high-speed rails, and remote terminals.

Benefits:
A standardized, readily accessible computer simulation program will be a useful tool to architects, engineers, and planners involved in terminal design and expansion. Simulations will aid the airport operator in evaluating terminal improvement options and planning for expansion. As a consequence, development grant funds will be used more efficiently and capacity enhancing designs can be identified.

Budget Item No.: 1e(7) R,E&D Plan: 3.7
Program Title: Capacity Development
Amount: $2,831,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	1,808	2,784	2,831	11,903

Basis for Request:
Develop air traffic control (ATC) concepts and procedures to reduce airport delays, more fully utilizing the instrument meteorological conditions (IMC) capacity of multiple runway configurations. Air traffic procedures and flight standards criteria for simultaneous triple and quadruple instrument flight rules (IFR) parallel approaches will be developed and validated. Develop the requirements and techniques for improved surveillance and navigation capabilities to support these procedures.

Description of Solutions:
Studies sponsored by the FAA and the aviation industry have identified operational concepts with the potential to reduce airport arrival delays by better utilizing multiple runway configurations in IMC. These concepts include simultaneous and independent IFR parallel approaches to triple and quadruple runways, as well as converging runways. ATC procedures and associated navigation and surveillance techniques for implementing the triple and quadruple IFR parallel approaches will be first developed. Promising concepts will be further explored and verified through ATC simulations and, in some cases, full-scale demonstrations at airports.

Program Request:
In FY 1990, real-time simulations of simultaneous IFR approach procedures to the proposed triple and quadruple parallel runways at Dallas/Fort Worth (DFW) Airport extended in length for turbojet operations were completed. These simulations were based on the current capabilities of the Airport Surveillance Radar (ASR). Additionally, simulations with ATC controller participation for developing national standards for triple and quadruple IFR parallel approaches based on current ASR

capabilities were completed. Development continued for the triple and quadruple parallel IFR approach procedures based on the capabilities of the improved data rate demonstration runway monitors at Memphis (MEM) and Raleigh Durham (RDU) airports. In FY 1991, real-time simulations of simultaneous IFR approaches to triple and quadruple parallel runways based on the capabilities of improved data rate runway monitors of MEM and RDU airports will be initiated. Proposed national standards for these multiple IFR parallel approach procedures will be validated through simulations. By FY 1991, a third parallel arrival runway will be completed at the DFW Airport and the IFR triple arrival streams will be monitored by existing ASR. Flight demonstration of triple IFR parallel approaches to triple runways, if necessary, will be conducted in late 1991 at the DFW Airport. In FY 1990, draft procedures for triple parallel IFR approaches to DFW when authorized will permit triple operations to the proposed third parallel runway which is scheduled for completion in 1991. This new triple parallel IFR capability will increase the IMC capacity of DFW over the current dual parallel operations by 50 percent. In FY 1991, draft procedures for quadruple IFR approaches to DFW when authorized will provide 100 percent increase in IMC capacity over the current dual parallel IFR operations. The fourth parallel runway at DFW is scheduled for completion in 1993.

Benefits:
The development of triple and quadruple parallel IFR approach procedures for DFW will enable this airport to achieve the capacity gains through the construction of new parallel runways. The development of national standards for IFR approaches to triple and quadruple parallel runways will permit airport planners and operators to design these additional runways with suitable runway centerline spacing or new airports with such configurations for increasing airport capacity.

Budget Item No.: 1e(8) R,E&D Plan: 10.5
Program Title: Airport Capacity Enhancement Planning
Amount: $1,138,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	1,035	2,156	1,138	5,883

Basis for Request:
Identify potential capacity enhancements and their benefits, develop methods to implement new technology, and report on the status of new airport capacity initiatives.

Description of Solution:
Collect and analyze data on the nation's capacity problems, prepare the annual Airport Capacity Enhancement Plan, and survey locations for applications of new technology. The planning process is continuous, adapted as necessary to respond to changes in available airport capacity.

Program Request:
During FY 1989, the Airport Capacity Enhancement Plan was issued identifying R,E&D goals and objectives for capacity. In FY 1990, the FAA conducted analyses of the benefits of new technology, Facilities and Equipment needs and procedures to enhance capacity as well as publication of the annual Airport Capacity Enhancement Plan. This effort will continue in FY 1991.

Benefits:
The plan serves as a primary planning document and source of information on delays and capacity projects.

Budget Item No.: 1e(9) R,E&D Plan: 2.7
Program Title: Simulation Model Development and Validation
Amount: $1,355,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	2,768	1,465	1,355	2,745

Basis for Request:
Provide an accurate, cost-effective, timely, and comprehensive analysis tool for modeling national airspace system (NAS) improvements. Simulation models will play a significant role in the future development of the NAS by identifying airport and airspace design enhancements and procedural alternatives.

Description of Solution:
The simulation model, SIMMOD, will be modified to include a number of logic enhancements which will increase realism in simulating the actual behavior of the air traffic control system and airline operations. The cost of extensive data preparation will be reduced by developing automated data acquisition hardware and software. Visual replay of scenarios will continue to be developed as an effective quality control technique and for specific site calibration. The model will be reprogrammed to operate on computer work stations. This will enable much faster simulation to perform more complex simulations involving groups of airports connecting airspace. Work will begin on an interactive simulation version which will assist air traffic control planners in procedures training and evaluation of new airspace configurations.

Program Request:
A tested public release version of SIMMOD was distributed in FY 1990. (An initial limited public release occurred in FY 1989.) Several logic enhancements were incorporated to improve the fidelity of the model. Model airspace applications completed or underway in FY 1990 included Dallas/Ft. Worth, Chicago, Denver, and Kansas City. Recent airport applications included Salt Lake City, Seattle, Raleigh/Durham, and San Diego Airports. A new version 2.0 was undertaken to permit SIMMOD operation on the work-station class of computer, from data entry through animated graphics.
For FY 1991, applications work will continue for both airport and airspace environments. Additional model logic enhancements to more realistically simulate aircraft movements through the airport and airspace will be accomplished. A computer work- station version of the simulation model will be completed along with full documentation of the model's algorithms and user manuals. Work will also begin on an interactive user friendly version to assist air traffic control planners in procedures training and evaluation of new airspace configurations. Model airspace applications envisioned in FY 1991 include New York, Indianapolis, Washington, Atlanta, Miami, and Jacksonville.

Benefits:
Simulation models permit both system users and designers alike to quickly test and evaluate potential design and procedural improvements in airport and airspace environments. Program benefits include delay reduction, and capacity enhancement.

Budget Item No.: 1e(10) R,E&D Plan: 6.3
Program Title: Precision Runway Monitor - High Data Rate
Amount: $2,000,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	5,400	2,031	2,000	3,000

Basis for Request:
Develop improved surveillance of aircraft flying approach, landing, and missed approach flight paths for closely spaced parallel runways, and converging runways to achieve increased airport capacities during instrument meteorological conditions.

Descriptions of Solution:
Tests being conducted at Raleigh-Durham Airport utilize a new high technology Electronically Scanning (E-SCAN) radar to monitor parallel and converging aircraft approaches during poor weather. The radar is capable of updating the targets under observation anywhere from two times a second to the current radar rate of about once every five seconds. Capacity increases between 40 and 100% are achievable without building new airports.

Program Request:
The procurement of a Precision Runway Monitor (PRM) system was initiated in 1987. The PRM utilizes technology developed for TCAS. At the Raleigh-Durham, North Carolina Airport, an electronically scanned (E-Scan) beacon radar is being tested for the first time in an air traffic control application. This system is capable of a 0.5 second update interval, compared with the 4.8 second update interval available from today's radars. An engineering model of this radar was delivered and tested in 1989. It will be ready for demonstrations in January 1990. An upgrade to operational status is expected in July 1991, with subsequent units available in 1993. Specifications for the operational upgrade were prepared in 1989, and a production specification will be prepared in 1990.

Benefits:
Provide for independent instrument approaches to multiple runway configurations. Annual delay savings estimated at over $200 million.

Budget Item No.: 1e(11)
Program Title: Wake Vortex Avoidance/Advisory System
Amount: $1,876,000

R,E&D Plan: 3.11

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	1,699	1,570	1,876	5,514

Basis for Request:
Reduce or minimize the adverse effects of the aircraft trailing vortices on the flow of air traffic, particularly arrivals, thereby safely increasing airport capacity.

Description of Solution:
The generalized approach to accomplish the program objectives will include a review of previous efforts related to the development, test, and evaluation of the vortex advisory system. Develop a concept for an enhanced vortex advisory system. Aircraft classification/separation standards will be reviewed and recommendations will be made for their updating. Characterizations of the wake vortices for the new generation aircraft (e.g., 757, 767, A-300) will be developed. NASA will support the FAA in the continuation of their research activities in areas of airborne detection and alleviation.

Program Request:
In FY 1990, a feasibility study of low-level windshear alert system instrumentation (LLWAS) for integration into the enhanced vortex advisory system (EVAS) was initiated. Efforts to characterize the vortex of new generation aircraft and vortex movement were initiated in FY 1990. This data will be used as input for re-evaluating separation and classification standards for aircraft and requirements for parallel and intersecting runways respectively. In FY 1992, a EVAS system will be deployed at an airport to demonstrate the effectiveness of an advisory system in addressing the vortex hazard issue and updating in-trail separation standards. The data derived from these efforts will serve as the basis for new or revised aircraft classification and separation standards, new or modified separation requirements for parallel and intersecting runways, and provide the controllers with an advisory system for predicting the presence of aircraft vortices in the airport approach/departure corridors. During FY 1991, the meteorological factors affecting the Wake Vortex behavior will be identified, and a report issued. In FY 1992, depending on the outcome of the aforementioned report this concept will be further developed through field testing. Data will be collected and analyzed to investigate varying aircraft spacing as a function of weather conditions.

Benefits:
The data derived from these efforts will serve as the basis for new or revised aircraft classification and separation standards, new or modified separation requirements for parallel and intersecting runways and finally provide the controller with hardware (EVAS) to sense vortex movement due to wind direction and velocity for reducing aircraft separation and increase capacity.

Budget Item No.: 1e(12)
Program Title: Airport Surface Traffic Automation (ASTA)
Amount: $4,082,000

R,E&D Plan: 3.6

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	1,896	2,343	4,082	17,858

Basis for Request:
Develop airport surface surveillance, communication and automation techniques to provide an effective runway incursion prevention capability. Provide departure traffic management to sequence aircraft to the departure end of the runway in accordance with schedules designed to expedite traffic flow out of the airport traffic area and to increase the capacity of the airport surface in all weather conditions.

Description of Solution:
ASTA improvements will be developed in three phases. Phase 1 will focus on the prevention of runway incursions based on radar surveillance, runway/taxiway signal lighting and an interface for the tower controller providing appropriate advisories and alerts regarding aircraft movements. In Phase 2, the automation equipment will generate and/or have knowledge of assigned taxi routes and will monitor aircraft movements for conformance to assigned taxi routes. Initial elements of the departure traffic management capability will be introduced in Phase 2. Phase 3 will utilize Mode S surveillance on the airport surface to provide aircraft identification (i.e., call sign) data as well as a data link communications capability. Phase 3 will provide a

comprehensive taxi routing capability, aircraft guidance via lighting systems and Mode S data link to assure conformance to taxi routes and a comprehensive departure management capability integrated with the arrival traffic management functions of terminal air traffic control automation (TATCA).

Program Request:
In FY 1990, promising technical alternatives for implementing ASTA functions were selected for more in depth development and design was initiated on a transportable, integrated ASDE/Mode S data link test bed. FY 1991 will focus on the development of the rapid prototyping laboratory, the implementation of initial ASTA designs in the laboratory for evaluation, and construction of initial elements of the ASDE/Mode S test bed.

Benefits:
Principal benefits of ASTA will be improved safety of aircraft operations on the airport surface and increased airport capacity.

Budget Item No.: 1e(13) R,E&D Plan: 3.5
Program Title: Terminal Air Traffic Control Automation (TATCA)
Amount: $7,582,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	3,837	6,786	7,582	48,358

Basis for Request:
Develop air traffic control (ATC) automation aids to help ATC controllers and supervisors to more fully utilize available terminal airspace capacity and to increase the safety and efficiency of aircraft operations into and out of terminal areas.

Description of Solution:
Terminal air traffic control automation (TATCA) will help air traffic controller teams at major airports handle larger volumes of departing and landing aircraft, particularly under instrument meteorological conditions. The principal automation function being investigated to accomplish this is a comprehensive traffic planning and controller coordination aid known as the TATCA dynamic traffic planner (DTP). A related TATCA activity is the accelerated development of a final approach spacing aid specifically for airports with converging approaches.

Program Request:
In FY 1990, initial TATCA planning and advisory aids were integrated into a rapid prototype laboratory at the contractor's facility and evaluated. Alternative controller display and machine interface concepts were analyzed and selections made for a more extensive evaluation and demonstration to be conducted in FY 1991. In addition, in FY 1990, the final approach spacing aid for converging approaches was evaluated in a laboratory environment and preparations began for operational evaluation of a prototype capability. In FY 1991, field evaluation of the converging runway approach display aid will be completed and a decision made on national implementation. Real-time testing of the TATCA logic will begin with the introduction of live radar and flight plan data. This software will include all of the capabilities that will eventually be required of an initial operational TATCA software configuration to be evaluated in the terminal area.

Benefits:
Terminal ATC Automation will help air traffic controllers to more fully utilize available terminal capacity (particularly under instrument conditions) and to better accommodate efficient aircraft operations along user-preferred flight paths. This will increase throughput and reduce delays in the terminal area.

Budget Item No.: 1e(14) R,E&D Plan: 10.4
Program Title: Airport Capacity Task Force Studies
Amount: $2,151,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	1,713	565	2,151	5,406

Basis for Request:
Establish a forum, sponsored and supported by the FAA, in which airport management, the local FAA, airlines, commuters, industry groups, and airport planning consultants work together to develop technically feasible alternatives for improving airport capacity and reducing delay.

Description of Solution:
Establish task forces at airports where the need for capacity improvements is identified. Each task force meets to develop alternatives for improving airport capacity. Alternatives are then evaluated using state-of-the-art simulations. The task forces typically investigate application of new air traffic control procedures and navigational aids, other system installations, airport development, and other prospective capacity improvements. The simulations provide a measure of benefit in terms of hours of delay reduction. Use of simulations in these task force studies allows the FAA to refine modeling techniques while gaining operational benefits through assistance to the task forces.

Program Request:
During FY 1989, airport capacity task force efforts were successfully completed in Memphis, Phoenix, St. Louis, Miami, and Kansas City. Task forces are in progress at seven other locations. New runways are being planned at Atlanta, Detroit, Kansas City, Phoenix and St. Louis as a direct result of the airport capacity task force efforts. Completed task forces have resulted in over 175 recommendations in FY 1989, 20 of which have been implemented with a potential delay savings of 70 thousand hours. An additional six task force studies were started in FY 1990. Action plans from each task force are assisting the FAA and the airport in planning and implementation of capacity improvements. Over 300 proposals have been developed for analysis by the task forces to enhance capacity. Six new task force studies will be initiated in FY 1991.

Benefits:
The simulations provide a measure of benefit in terms of hours of delay reduction. Use of simulations in these task force studies allows the FAA to refine modeling techniques while gaining operational benefits through assistance to the task forces. The task force studies produce a report for the airport recommending a comprehensive program of capacity improvement measures to reduce the level and cost of delay at the airport.

Budget Item No.: 1e(15) R,E&D Plan: 2.8
Program Title: National Airspace System Performance Analysis Capability (NASPAC)
Amount: $2,516,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	1,200	2,363	2,516	2,978

Basis for Request:
Achieve a long-term analysis capability through the application of operations research techniques to the development, design, and management of the Nation's airspace on a systematic level. This capability will identify the limiting factors in national airspace system (NAS) performance and provide quantitative analysis to determine the impact of proposed changes on the overall aviation system.

Description of Solution:
NASPAC will be enhanced to analyze the NAS in greater detail than current levels permit. Evaluative tools such as controller workload indicators and aircraft operating costs will be added. Applications studies will be expanded to include analyzing the effect of aviation forecast activity on airport networks and airspace sectors. A simplified user friendly version will be developed to permit in-house FAA personnel to use NASPAC with minimum training and preparation.

Program Request:
Several enhancements were added to NASPAC in FY 1990, including a more complete simulated portrayal of the NAS. Improvements in airspace design and management will be the direct result of these efforts as well as accomplishments planned in FY 1991. NASPAC applications completed include the system wide effects of the proposed new Denver airport, the expanded Dallas/Ft. Worth Metroplex, an analysis of southern California airspace, the effects of airline hubbing, and an analysis of reduced aircraft separation procedures on system performance. The impact of airline hubbing, proposed new airports, and identification of future airspace/airports was also completed. For FY 1991, work will continue on further NASPAC refinements, particularly on airspace sector modeling, and user friendliness. NASPAC will be structured to generate additional report information to users and analysts. Information describing aircraft sector loading, controller workload indicators and aircraft operating costs, for example, will be incorporated with NASPAC output. Additional studies and analyses

to identify forecast system bottlenecks, and the effects of airport and airspace improvements to the system will be undertaken in FY 1991. Also in FY 1991, NASPAC will incorporate a weather annualization capability to better predict system delay impacts over a range of weather scenarios. A simplified, user-friendly, desk-top version will be completed to permit FAA personnel to use the model with minimum training and preparation.

Benefits:
Evaluation and qualification of proposed system changes to reduce aircraft delays, increase traffic throughout, and increase airport capacity. Foster improvements to airspace design and management.

R,E&D Plan: 2.9

Budget Item No.: 1e(16)
Program Title: Airspace System Models
Amount: $946,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	0	773	946	5,074

Basis for Request:
Develop analytic models, including computer simulations, for evaluating current and future national airspace system (NAS) impact of new NAS equipment, air traffic control (ATC) procedural changes revised airspace configurations, and controller workload. The program supports provisions of the Aviation Safety Research Act of 1988, which requires development of models of the ATC system and for testing proposed ATC revisions. Models developed are designed to explicitly describe the ATC environment within the NAS in a high-level detail and fidelity.

Description of Solution:
This project develops analytic models and applies optimization techniques for evaluating future ATC changes. Models will be used to analyze the system impact of new equipment, procedural changes, revised airspace configurations, and the effects of weather on ATC. The process includes identifying system requirements, developing design specifications, model development, and implementation. The models will be designed for possible inclusion into the planned national simulation facility.

Program Request:
Specification of model requirements and initial system design were completed in FY 1990. Initial prototype models to evaluate controller workload in current and future en route airspace sectors were completed for use by ATC strategic planners.
FY 1991 efforts include expansion of prototype models into interactive tools for hands-on use by ATC personnel in headquarters and the field. Additional models will be developed to assist air traffic system planners in designing airspace sectors to achieve a more evenly distribute controller workload and permit greater efficiency of aircraft movement across sectors.

Benefits:
Use of interactive airspace models permit users and managers of the ATC system to identify and evaluate airspace design and procedural improvements. Benefits include enhanced safety, reduced controller workload, greater flight efficiency and reduced aircraft delays.

RESEARCH, ENGINEERING, AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Fiscal Year 1991

BUDGET ACTIVITY 1: AIR TRAFFIC CONTROL; SUBACTIVITY 1f: TECHNOLOGY

Budget Item No.: 1f(1) R,E&D Plan: 8.1/8.2
Program Title: Satellite Applications
Amount: $3,164,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	1,577	3,218	3,164	15,516

Basis for Request:
The purpose of this program is to utilize available satellite technology to provide communications, navigation, and surveillance (CNS) services for civil aviation. There is substantial interest in satellite system applications, but questions remain concerning their application in the civil aviation environment and their economic viability. This program is to support decisionmaking on the use of satellites in aviation and to establish standards for their use.

Description of Solution:
This program assesses current and emerging satellite technologies for potential use in the National Airspace System. Assessments include detailed analysis of requirements, new CNS techniques, including technical and economic characteristics, risk factors, transition strategies, availability, and required standards. These assessments include laboratory simulations and operational testing of prototype equipment at the FAA Technical Center to establish the feasibility of techniques and to verify standards.

Program Request:
During FY 1990, work continued in developing satellite-based air-ground communication standards for digital data and voice. This effort has included laboratory simulations and flight tests at the FAA Technical Center. These activities will continue through FY 1991 with a goal of establishing international standards through the International Civil Aviation Organization (ICAO) Aeronautical Mobile Satellite Services (AMSS) panel by the mid-1990's. The DOD Global Positioning System (GPS) is the satellite-based navigation system that will benefit civil aviation. GPS is expected to be available for use by civil aviation in 1993, and efforts are underway to permit its use as a supplemental system. To obtain the full benefits of GPS, the integrity (warning to the pilot when the GPS position solution is outside of tolerance) issue must be resolved. Two efforts to resolve this issue are under investigation. The first is a network of ground GPS monitors that generate an integrity message which is transmitted to the aircraft via a satellite data link (the satellite data link may also provide another ranging signal for navigation). The second is to develop user equipment that can use signals from both GPS and the Global Orbiting Navigation Satellite System (GLONASS), a USSR satellite-based system similar to GPS, and have the integrity monitoring and warning self-contained in the user equipment. In FY 1990 and FY 1991, work will continue in developing the two different approaches. Long-term GPS application work in FY 1991 includes investigation of improved nonprecision approaches using differential GPS (this effort is in conjunction with the U.S. Air Force and NASA Ames), the use of GPS velocity information in a variety of applications including windshear detection, and carrier phase tracking for improved accuracy. Work will continue in the satellite program during FY 1991 to investigate methods for Cooperative Independent Surveillance (CIS) via satellites. Also, other new emerging technology such as satellite-antenna-generated spot beams and spread spectrum methods will continue to be investigated in FY 1991 for civil aviation applications.

Benefits:
Satellite technology will permit extensions of air traffic services to airspace regions where existing ground-based CNS facilities provide limited services. Initial benefits will accrue to oceanic regions in terms of improved safety and efficiency of flight operations. Later, similar benefits will accrue in low-altitude, offshore, and remote areas. In the long-term, satellite-based CNS capabilities may eliminate the need for substantial portions of the existing en route airway facilities infrastructure.

Budget Item No.: 1f(2) R,E&D Plan: 3.4
Program Title: ATC Applications of Automatic Dependent Surveillance (ADS)
Amount: $5,198,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	5,111	4,420	5,198	8,640

Basis for Request:
Exploit the ADS function as a means for improved air traffic control (ATC) operations in oceanic and domestic environments, including the increased safety and efficiency of flight operations.

Description of Solution:
Oceanic ATC operations are today conducted manually, with controllers monitoring aircraft flight progress based on voice position reports from flight crews. Aircraft must adhere to rigid route structures, and relatively large separations must be maintained to accommodate navigation inaccuracies and the lack of accurate position reports at frequent intervals. The resulting airspace capacity limitations and the inability of controllers to approve flight plan changes force aircraft to operate on less efficient routes. Similar problems exist for offshore and low-altitude domestic airspace. The ADS system will permit tactical and strategic control of aircraft. Automated position report processing and analysis will result in near-real-time monitoring of aircraft movement. Automatic flight plan deviation alerts and conflict probes will support increased safety, reductions in separation minima, and increased accommodation of user-preferred routes and trajectories. Graphic display of aircraft movement and automated processing of data messages, flight plans, and weather data will significantly improve the ability of the controller to manage oceanic air traffic. This program will be developed in incremental steps, the first being ADS position reporting and blunder detection. The second step will add the two-way digital data link for air traffic command and control. Follow-on steps will add other features, including digital voice and improved displays, all leading to safer and more efficient use of the airspace. When these products are developed, tested and specified. they will be made available for implementation into the operational ATC system.

Program Request:
In FY 1989, we completed the ADS (Step 1) specification and the preliminary ADS design. Also in this timeframe, the draft of the Step 2 performance requirements for the communications link was completed. In FY 1990, we developed the specification and operational concepts for the two-way satellite data link (Step 2). In FY 1991, we will conduct pre-operational trials with various airlines to develop operational procedures. Participating airlines and ground stations will modify aircraft and processing equipment with FAA support to accommodate the voice capability. The new avionics package will undergo test and evaluation under a real operational environment during the pre-operational trials.

Benefits:
Improved Safety (blunder detection and correction)
Separation reduction (increased capacity)
Reliable two-way satellite communication
Improved airline fuel efficiency

RESEARCH, ENGINEERING, AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Fiscal Year 1991

BUDGET ACTIVITY 1: AIR TRAFFIC CONTROL; SUBACTVITY 1g: SUPPORT

Budget Item No.: 1g(1) R,E&D Plan: 2.13
Program Title: FAA/NASA Cooperative Programs
Amount: $1,057,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	938	961	1,057	5,644

Basis for Request:
Provide the most cost-effective R,E&D program by working with NASA on programs of mutual interest. Capitalize on complementary research being conducted at NASA research centers, cosponsor research of joint interest, and make use of unique NASA facilities to achieve FAA R,E&D program goals.

Description of Solution:
The FAA cooperates with NASA on programs of mutual interest by contributing funding to NASA's in-house research programs, conducting research projects in joint partnership with NASA, and conducting independent research in NASA facilities using FAA personnel. Cooperative projects are accomplished via "Memorandum of Agreement" which incorporate statements of work setting forth specific research projects to be accomplished. FAA engineering field offices have been established at NASA's Ames and Langley Research Centers to support joint FAA/NASA projects and provide coordination of NASA work. The FAA personnel stationed at the field offices also conduct independent FAA R,E&D tasks when the nature of the research falls outside of NASA's charter or resources. The field offices represent a unique resource for the FAA because of their proximity and access to NASA facilities, their knowledge of NASA personnel and ongoing NASA research, and their understanding of FAA's needs.

Program Request:
Cooperative areas of endeavor has been established with NASA in the following areas: Human Factors, Severe Weather, Cockpit/ATC Integration, Airworthiness, Environmental Compatibility, and Program Support. FAA field offices at Ames and Langley Research Centers are supported under the Program Support category. In FY 1991, activities will continue under the cooperative areas established and listed above.

Benefits:
Cooperative programs with NASA extend the range and scope of the FAA R&D mission by capitalizing on NASA's manpower, project expertise, resources, and facilities to the extent they complement or enhance FAA programs.

Budget Item No.: 1g(2) R,E&D Plan: 2.10
Program Title: Joint University Program
Amount: $310,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	200	182	310	1,326

Basis for Request:
Pool resources with NASA in areas of common interest through the use of interagency agreement. This activity will also develop the personnel needed to develop and manage the components of the National Airspace System.

Description of Solution:
Award research grants via contract to three universities: Massachusetts Institute of Technology (MIT), Ohio University and Princeton University. These research activities are intended to be interactive, especially on a student to student basis, and build on the particular strengths of each of the universities. The program is consistent with the interests of the FAA and NASA in furthering the safety and efficiency of the National Airspace System (NAS) and developing a cadre of technical people. The principal objectives are to further understanding of selected topics in the design and operation of aircraft that are used principally to transport passengers and cargo, in the effects of atmospheric environment on aircraft flight, and in the development and utilization of the NAS.

Program Request:
Current research activities include: airport capacity research, advanced avionics, controls, and human factors, aircraft safety research, aircraft materials and structure, and satellite technology.

Benefits:
This activity provides for joint funding, technical coordination and the joint performance of mutually beneficial research between the FAA and NASA, and the use of their facilities in applied research and development germane to the entire spectrum of the NAS programs.

Budget Item No.: 1g(3) R,E&D Plan: 2.5
Program Title: Program Support
Amount: $2,864,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	2,329	2,791	2,864	11,865

Basis for Request:
Provide management tools and procedures for use in monitoring, tracking, directing, and coordinating research, engineering and development (R,E&D) activities. Support new R,E&D initiatives.

Description of Solution:
Support management of R,E&D programs by enhancing the capability to monitor, track, and coordinate all portions of R,E&D activities. Provide initial support to new R,E&D concepts and technology initiatives.

- o Define phased scope to be covered by management information system (MIS).
- o Implement a computerized management information system. A phased approach will be used with most critical types of information and projects receiving priority.
- o Develop, procure, and implement specific tools or procedures to address needs identified through evaluation.
- o Identify and support the development of new programs and products for the future aviation system.

Program Request:
During FY 1989, a phased approach to implementation of an MIS was formulated and a fully automated MIS support was implemented for R,E&D budget formulation, planning, execution and control. In FY 1990, additional management information support was provided for tracking schedules, products and requirements for each, R,E&D program. In FY 1991, the final stages of the MIS will be implemented providing complete management and control capabilities.

Benefits:
Benefits are derived form this program by providing a cost effective R,E&D program through management by state-of-the-art management information tools.

Budget Item No.: 1g(4) R,E&D Plan: 2.14
Program Title: R,E&D Advisory Committee
Amount: $180,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	0	0	180	780

Basis for Request:
Provide administrative support for the Research, Engineering and Development (R,E&D) Advisory Committee as required by the Aviation Safety Research Act of 1988 (Public Law 100-591).

Description of Solution:
Establish an R,E&D Advisory Committee. The objective of the committee is to provide advice and recommendations to the Administrator regarding the needs, objectives, plans, approaches, contents, and accomplishments with respect to the aviation research program. In this capacity, the committee will consider aviation research needs in support of the FAA mission and specifically address areas such as airport capacity, system safety, aircraft safety, aeromedical research, aviation security, future technology, and the National Airspace System--present and future. The committee shall also assist in assuring that such research is coordinated with similar research being conducted outside of the FAA. The committee has a membership which represents a

balance in points of view from the aviation community including representatives from user groups, universities, corporations, associations, consumers, and other Government agencies. The meetings are open to the general public.

Program Request:
During FY 1989, the R,E&D Advisory Committee was established and two meetings of the full committee were held. Five subcommittees were formed for a review of the FAA's R,E&D process and organization, a review of the substance and approach of the FAA's R,E&D Plan, a review of FAA's aviation medicine programs, system capacity issues, and transport aircraft safety. Committee meetings were held during FY 1990 and will continue in FY 1991.

Benefits:
Improved use of R,E&D resources through a committee of aviation experts representing a cross-section of the aviation community providing input and advice to the Administrator on the R,E&D Plan, the development of new requirements and concepts, and special topics of interest to the aviation community.

Budget Item No: 1g(5) R,E&D Plan: 2.12
Program Title: Small Business Innovation Research (SBIR) Program
Amount: $1,000,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	900	1,000	1,000	5,476

Basis for Request:
The SBIR Program is congressionally mandated by the Small Business Innovation Development Act of 1982 (P.L. 97-219) and is scheduled to run until at least 1993. It is funded through a 1.25 percent assessment of the agency's extramural R,E&D budget plus administrative costs. Project R,E&D funds may also be applied to the SBIR program on an ad-hoc basis. The program's purpose is to stimulate technological innovation, use small business to meet federal research and development needs, increase private-sector commercialization of innovations derived from federal research, and foster and encourage the participation of minorities and disadvantaged in the development of technological innovations.

Description of Solution:
Research topics are solicited from the various technical specialty groups throughout the agency. These topics then appear in an annual solicitation for proposals issued annually by the Department of Transportation (DOT). Individuals who submitted the topics evaluate the proposals and the winners are chosen based on the evaluations and agency needs. Those firms selected to receive an award then embark on the following three-phase process:

- Phase I is for the conduct of feasibility-related experimental or theoretical research, or for R,E&D efforts up to $50,000.
- Phase II is for the principal research effort, and has a performance period of approximately two years and is funded up to $300,000.
- Phase III is for the commercialization of the research conducted under phases I and II.

Program Request:
During FY 1989, 14 research topics were chosen from agency submissions. These topics were advertised in the DOT SBIR solicitation and 227 research proposals were submitted by bidding firms. Fifty individual evaluators are reviewing these proposals and based on their findings Phase I and II awards will be recommended to the FAA and DOT council. Contracts to the winning firms will be awarded prior to the end of calendar year 1989. FY 1990/FY 1991 activities are similar. An SBIR conference was hosted in the fall of FY 1990.

Benefits:
By virtue of its agency-wide scope, the SBIR program benefits the entire spectrum of programs which make up the National Airspace System (NAS) modernization effort. Among its advantages are the ability to supplement the budgetary and technical resources which can be applied to NAS programs. It can accomplish this in an extremely timely and cost effective manner. By enabling small high technology corporations to start up and prosper, the SBIR contributes in a larger sense to the domestic economy and technology infrastructure.

Budget Item No: 1g(6) **R,E&D Plan:** 2.11
Program Title: Transportation Research Board (TRB)
Amount: $200,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	200	200	200	800

Basis for Request:
Stimulate research concerning the nature and performance of aviation transportation systems, disseminate the information produced by research, and encourage the application of appropriate research findings. The Transportation Research Board is a unit of the National Research Council, which serves the National Academies of Sciences and Engineering.

Description of Solution:
Award research contracts to the TRB. This program is carried out largely by committees, task forces, and panels staffed by industry, public officials, and university experts who serve without compensation. The Board's efforts will include research on the future of aviation, a graduate research award program on technical and management innovations for civil aviation facilities in the next century, and other special research projects to further the safety and efficiency of the national airspace system (NAS).

Program Request:
In FY 1990, the following studies were completed through the Graduate Research Program: (1) Joint Development and How It Might Be Expanded Upon to Increase Financial Efficiency of Airports, (2) Measuring General Aviation Safety: Where Can Safety Improvements Be Made, (3) Cockpit Crew Decisionmaking in Crisis Situations, (4) Advanced Airspace Management and Automatic Landing Systems, and (5) Empirical Model for Runway Occupancy Time and the Development of Automated Exit Guidance Control. These products will help the public sector focus on technical and management innovations developed by the academic and private sector to resolve critical issues of the present and the future. They will give an independent perspective as to means that could be used to improve safety, manage the NAS, increase capacity, and increase productivity. In FY 1991, the TRB will continue the Graduate Research Award Program on Public-Sector Aviation Issues and will award stipends to at least five highly qualified applicants. Industry/public-sector forums and workshops will be conducted on various aviation issues of the day which relate to research to further the safety and efficiency of the NAS. The bi-annual workshop to develop consensus opinions on future aviation trends and market conditions which assists in forecast projections will be conducted. A forum on public/private sector input to FAA strategic planning will be conducted.

Benefits:
A very cost-effective means of obtaining research input from both the academic community and the private sector on technical and management innovations that will help the public sector provide civil aviation services and facilities into the next century.

Budget Item No: 1g(7) **R,E&D Plan:** 2.18
Program Title: Technology Transfer Program
Amount: $960,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	0	0	960	3,326

Basis for Request:
Promote the rapid movement of FAA laboratory research results and technologies into the mainstream United States economy. Technology Transfer is congressionally mandated by the Stevenson-Wydler Technology Innovation Act of 1980 (P.L. 96-480), the Federal Technology Transfer Act of 1986 (P.L. 99-502), and Executive Order 12.591 of April 10, 1987, titled Facilitating Access to Science and Technology.

Description of Solution:
Technology transfer will be accomplished by encouraging the collaboration of the FAA with State and local Governments, universities, and businesses through Cooperative Research and Development Agreements (CRDA). Additionally, the Office of Research and Technology Application (ORTA) will promote "Science Entrepreneurs" to act as conduits between the FAA, other Government agencies, and the private sector, implementing a royalty sharing program for FAA inventors.

Program Request:
In FY 1989, the ORTA was established at the FAA Technical Center and is responsible for implementation of technology transfer as defined in the laws. An order on the FAA's Technology Transfer Program was published and a Technology Transfer Program Plan was developed. In FY 1990, submitted annual report on agency technology transfer initiatives and progress to Congress as mandated by P.L. 99-502, and developed a long-range plan for agency technology initiatives. Internal Educational seminars were developed and held on technology transfer responsibilities, CRDA, and patent/licensing process and royalty sharing implication for FAA employees. Additionally, development of a data base and a mechanism to disseminate information on relevant technology to FAA elements and to respond to external requests for technology information was initiated. In FY 1991, we will submit the annual technology transfer initiatives and progress to Congress. FAA's technology transfer initiatives program plan will be updated, and internal education seminars will be held.

Benefits:
FAA access to private sector and other Government agency technology bases. Leveraging of R,E&D dollars and resources through the use of cooperative research and development agreements. Ability to attract and retain top notch technical people through the royalty sharing and awards program. Increased private sector awareness of FAA programs and requirements. Private sector access to unique FAA facilities to accomplish needed R&D. Royalty sharing through exclusive licensing of patents to private sector. Initiatives will help foster a more efficient R,E&D effort and a healthier more competitive U.S. industrial economy.

Budget Item No.: 1g(8) R,E&D Plan: 2.16
Program Title: Graduate-level Research and Education in Aviation Technology(GREAT) Program
Amount: $1,256,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	0	0	1,256	7,280

Basis for Request:
The program involves education and research activities associated with emerging concepts/technologies related to air traffic control systems and with scientific/technological advances related to aviation safety/security. The focus of this effort is a series of interrelated activities that provide technology advancements which enhance the capability of the National Airspace System (NAS) and improve the safety and security of aircraft operating within that system. Simultaneously, this program will address the shortage of talented engineers and scientists who have the necessary skills, interest, and ability to accomplish this vital work.

Description of Solution:
Participants in the program engage in formal course work at Rutgers University and conduct research in FAA laboratories on FAA directed research topics. The program includes an expansion of university education and research activities in area related to air traffic control (ATC) systems and aircraft safety. Companion education and training activities for agency personnel have also been included to develop and enhance existing capabilities within the FAA. Central to this effort is the establishment of a new engineering graduate level program in decision systems engineering. The establishment of this new discipline is intended to foster research in advanced ATC concepts and also provide a new and challenging area of study for graduate students.

Program Request
Efforts to establish the program have been in progress. In FY 1991, research topics will include: knowledge acquisition, representation, and management; object oriented software for real-time control; parallel computing for real time decision and control processes; strategic and reactive planning in a human machine environment; reliability modeling of large scale decision support systems; availability and maintainability of air traffic systems, mathematical modeling of decision criteria; adaptation of expert system frameworks to control decisionmaking; impact dynamics of flexible bodies, dynamic analysis of complex structures and dynamic stress concentration in composite materials.

Benefits:
This program is intended to meet, in part, the FAA's requirement for research in ATC systems engineering and aircraft/airport safety. Through this unique program, students will have the opportunity to become involved in research at the Technical Center on new concepts and technology to increase ATC capacity without sacrificing safety or

reliability. The program also will provide an update/enhancement of technical skills to FAA managers responsible for policy making in areas related to ATC systems engineering and aviation safety. In addition, the program will provide a source of highly motivated and skilled technologists.

RESEARCH, ENGINEERING, AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Fiscal Year 1991

BUDGET ACTIVITY 1: AIR TRAFFIC CONTROL; SUBACTIVITY 1h: ROTORCRAFT AND POWER LIFT VEHICLES

Budget Item No.: 1h(1) R,E&D Plan: 3.8
Program Title: Rotorcraft/Power Lift Vehicles IFR Operations Evaluation
Amount: $1,091,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	2,048	1,441	1,091	7,537

Basis for Request:
Evaluation and development of procedures and systems which will encourage and enable full utilization of rotorcraft and civil tiltrotor operational capabilities. Airborne and ground technologies offer promise of significant improvements in operational flexibility and assisting in capacity increases. This program will explore each promising area. Effective utilization of the rotorcraft and civil tiltrotor will require the ability to operate from vertiports with ready access to population centers and existing airports.

Description of Solution:
Develop tiltrotor Terminal Instrument Procedures (TERPS). Modify existing rotorcraft TERPS so as to allow helicopters to make use of more sophisticated avionics and to conduct operations not possible with today's basic TERPS criteria. Included in this effort are vehicle definitions and evaluations required to support TERPS development.

Program Request:
Testing and analyses will be accomplished in FY 1990 through FY 1994 that will assist in determining methods and procedures to allow reduction of the areas required for heliport lighting systems. Results will be published in FY 1993/1994. Improved TERPS criteria will allow more efficient use of the limited available airspace in terminal areas. Civil tiltrotor TERPS development began in FY 1990 via the use of simulators. Simulators will allow preliminary TERPS development in the absence of a suitably equipped IFR tiltrotor. The simulation efforts will provide the basis for confirming draft tiltrotor TERPS via flight testing when a suitably equipped aircraft becomes available and it will shorten the amount of time needed for TERPS development. Tiltrotor TERPS are part of the infrastructure that must be developed in order to allow this aircraft to conduct IFR operations.

Benefits:
User benefits will include the assurance that more sophisticated avionics will provide greater operational flexibility in rotorcraft flight while maintaining the safety of aircraft operations. TERPS are part of the infrastructure that must be developed in order to support helicopter and tiltrotor IFR operations into heliports and vertiports.

Budget Item No.: 1h(2) R,E&D Plan: 9.3
Program Title: Rotorcraft/Power Lift Vehicles Obstruction Avoidance
Amount: $311,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	885	262	311	2,761

Basis for Request:
Develop the technology and methodology to detect and avoid obstructions during rotorcraft/power lift vehicle operations at low altitudes.

Description of Solution:
Analyze accidents to identify common scenarios which have a high risk of collision. Define appropriate procedures and technologies which could reduce collision risks in the identified scenarios. This will include consideration of cockpit workload and its effect on collisions and means of reducing such workload where necessary. Investigate obstacle detection technologies and identify most promising technologies for development of certification criteria.

Program Request:
In FY 1989, a study of the characterization of rotorcraft accidents involving obstructions was initiated and an analysis of rotorcraft systems and equipment was begun. In FY 1990, the analysis of accident scenarios was completed and appropriate technologies and procedures that could reduce the risk of collisions were identified. In FY 1991, this effort will continue and detailed study of the identified technologies will begin. A study of the interaction of workload and the aircraft equipment will be initiated. This effort will provide improved safety of operations through the improved ability to avoid obstruction collisions. In addition, it will enable an increase in the utility of rotorcraft because of the ability to operate safely in a wider range of situations. This effort will bring about an improved understanding of the requirements for operation of rotorcraft in different visibility conditions.

Benefits:
Improved safety of operations through the improved ability to avoid obstruction collisions. Increased utility of rotorcraft because of the ability to operate safely in a wider range of situations. Improved understanding of the requirements for operation of rotorcraft in different visibility conditions.

Budget Item No.: 1h(3) **R,E&D Plan:** 3.9
Program Title: Rotorcraft/Power Lift Vehicles ATC Procedures
Amount: $116,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	2,026	636	116	3,830

Basis for Request:
Increase capacity through the prudent combination of airplane and rotorcraft air traffic and facilitate a more dynamic and responsive rotorcraft transportation segment. Develop procedures for the common usage of en route and terminal airspace that take advantage of the unique characteristics of rotorcraft to optimize system capacity.

Description of Solution:
Analyze the air traffic control (ATC) procedural methodology applied specifically to rotorcraft and the interaction of these ATC procedures with rotorcraft operational limitations. Develop new procedures based on the observed and derived limitations of existing methods. Design the capability to simulate an ATC environment specifically in enough detail to allow modeling the typical rotorcraft operating environment. Use this simulation capability to test the resulting procedures and determine candidates for full scale testing.

Program Request
In FY 1990, evaluations of rotorcraft terminal ATC procedures and low-altitude route structures were completed and final draft recommendations for revisions to appropriate standards were submitted. Rotorcraft ATC simulations capabilities begun in FY 1989 and developed through FY 1991 will be validated in FY 1992. This simulation capability will be used to validate the recommended terminal procedures developed for rotorcraft. En route rotorcraft operations will be evaluated in FY 1991 and FY 1992 with results to be published in FY 1993. In FY 1991, tiltrotor procedures evaluation begun in FY 1990 will continue using simulation to ascertain the ability of the vehicle to perform using the proposed procedures and the ability of the ATC system to support proposed operations. Results will be published in FY 1992. This effort is intended to develop ATC procedures that take advantage of more sophisticated avionics in order to provide greater operational flexibility in rotorcraft flight while maintaining the safety of aircraft operations, improved rotorcraft productivity, increased NAS capacity through use of rotorcraft, reduced development cost of ATC procedures, and provide faster development of ATC procedures.

Benefits
Benefits include the assurance that more sophisticated avionics will provide greater operational flexibility in rotorcraft flight while maintaining the safety of aircraft operations, improved rotorcraft productivity, increased NAS capacity through use of rotorcraft, reduced development cost of ATC procedures, and faster development of ATC procedures. Terminal instrument procedures (TERPS) are part of the infrastructure that must be developed in order to support rotorcraft and tiltrotor IFR operations into heliports and vertiports.

Budget Item No. 1h(4) R,E&D Plan: 3.12
Program Title: Rotorcraft Separation Standards
Amount: $255,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	146	196	255	1,263

Basis for Request:
To develop classification and separation standards to ensure safety of flight operations while permitting a more expeditious flow and mix of air traffic.

Description of Solution:
Collect data on the intensity and duration of rotorcraft wake and downwash flow fields. Develop model for rotorcraft hazards in wake-vortex encounters and validate the model with flight tests. Draft separation standards for rotorcraft operations.

Program Request:
A report of characteristics of rotorcraft wake vortices was completed in FY 1990. This report recommends classification and separation standards for fixed wing aircraft following rotorcraft on approach or departure. Separation standards resulting from these recommendations will ensure the safety of rotorcraft flight operations. The FY 1991 effort will address the hazards associated with rotorcraft behind rotorcraft and rotorcraft behind fixed wing.

Benefits:
o Safe aircraft operation through the development of separation standards.

Budget Item No.: 1h(5) R,E&D Plan: 11.5
Program Title: Rotorcraft Simulator Standards
Amount: $157,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	337	366	157	2,887

Basis for Request:
Establish necessary criteria and guidance for rotorcraft simulators used for the training or evaluation of crew members.

Description of Solution:
Determine the extent to which rotorcraft simulator field of view, visual and motion system time lag impact the pilot control of the vehicle. Develop a minimum performance set of standards for filed of view, visual scene details, visual system transport lag, minimum degree of freedom of motion system, and performance level for each degree of freedom, for each phase of flight (in ground effect and out of ground effect). Develop an analysis of the interrelationship of the visual system cuing with the motion system cuing for the final development of qualification criteria for rotorcraft simulators. Evaluate current rotorcraft simulator mathematical models. Determine the adequacy of available helicopter aeronautical data and make improvements as required.

Program Request

Simulator Visual Scene
In FY 1989, simulation testing was initiated to develop certification criteria for the visual scene of high fidelity rotorcraft simulators. The visual scene must support the low speed flight regime including the capability to simulate hovering. This effort continued in FY 1990 with emphasis on resolution, field of view, scene detail, and the other factors affecting flight training.

Simulator Motion Scene
Planning for the development of simulator certification criteria to faithfully replicate the handling characteristics of rotorcraft was completed in FY 1989. In FY 1990, simulation testing began to explore the motion system requirements data base. Coordination of this test phase with the visual scene phase will result in an integrated test plan that will be implemented in FY 1991.

Benefits:
Use of an appropriate simulator can replace part of the actual flight time required for initial and recurrent training and will reduce the cost of these functions. Simulator training is also safer than actual flight training.

Budget Item No.: 1h(6) R,E&D Plan: 11.6
Program Title: Rotorcraft/Power Lift Vehicles Display and Control Studies and Certification Support
Amount: $1,047,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	324	350	1,047	5,393

Basis for Request:
Develop crew performance behavioral criteria that can be used to evaluate and certify new cockpit display and control technology for rotorcraft and civil tiltrotor use. Support the regional certification efforts for the civil version of the V-22 Osprey tiltrotor and the new civil tiltrotor expected to be in commercial service in 1995. Support the development of Power-lift Vehicle Certification Criteria, Normal Category. Support the update of the Power-lift Vehicle Certification Criteria, Transport Category.

Description of Solution:
Evaluate current state-of-the-art in-flight performance assessment and cockpit technology. Assess current and anticipated operational requirements for rotorcraft/power lift vehicles. Identify information requirements and conduct task analyses of critical instrument meteorological conditions flight operations. Develop crew and aircraft performance standards for determination of display and control integration requirements for representative performance-critical rotorcraft operations. Develop tiltrotor certification criteria for technical issues relating to human performance, to the transition and approach phases of flight, and to aviation system integration. Utilize DOD V-22 data and experience to accelerate establishment of criteria.

Program Request:
In FY 1989, human factors analysis was initiated to determine equipment and systems that would enhance advanced rotorcraft and other powered lift, vertical flight safety. The focus is upon future heliport/vertiport concepts, as well as in the evolving terminal control systems that will be used in minimal VMC and actual IMC operations. The intent of this project is to develop certification criteria reflecting the emerging new technology and classes of display and control systems. By also evaluating these systems for capabilities for reducing MLS TERPS airspace requirements, this project will assist in contributing rotorcraft solutions to airspace system capacity problems. This will also help in meeting anticipated increased rotorcraft traffic in the next decade.

Spanning the FY 1990 through FY 1995 period, the Display and Control Studies Project milestones and key events include:

- o Continue analysis of candidate static cockpit displays in FY 1990.
- o Develop guidelines for design standards for use in FY 1993.
- o Develop TERPS design criteria FY 1993 through FY 1995.
- o Provide certification criteria guidelines in FY 1995.

Benefits:
More sophisticated avionics will provide greater operational flexibility while maintaining the safety of aircraft operations.

Budget Item No.: 1h(7) R,E&D Plan: 10.7
Program Title: Heliport/Vertiport Design and Planning
Amount: $1,041,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	380	858	1,041	5,382

Basis for Request:
Develop design standards and planning guidelines for heliports and vertiports. Develop guidelines, for use by community and disaster relief organizations, describing how to integrate the use of rotorcraft/heliports into disaster relief planning and operations.

Description of Solution:

Analyze rotorcraft operations at certain public, city-center heliports; heliport accident experience; and the results of AIP funded state and local vertiport planning efforts. Develop guidelines describing how to integrate the use of rotorcraft/heliports into disaster relief planning and operations. Develop enhancements to the existing FAA heliport and vertiport design criteria advisory circulars.

Program Request:

In FY 1989, draft advisory circular material for state heliport system planning was developed and coordinated within FAA. In FY 1990, national heliport planning guidelines were published as a new chapter in an advisory circular on state airport system planning. Development of draft advisory circular material for metropolitan heliport system planning has been delayed in order to coincide with the proposed revision of the advisory circular on metropolitan airport system planning in FY 1991. National heliport/vertiport planning guidelines will provide the FAA with a means of making long-term capital investment decisions on AIP funding of heliports/vertiports. Analysis of rotorcraft operations at selected public heliports was initiated in FY 1989. This effort which continued in FY 1990 will continue in FY 1991 and FY 1992. Results will be published in FY 1993. This information will be used by heliport planners as an aid in determining whether particular heliports are likely to be successful. In FY 1989, analysis of heliport accidents was initiated. This effort continued in FY 1990 and throughout FY 1991. Results will be published in FY 1992. This effort will determine if accident experience points to a need for changes in heliport/vertiport design criteria. Results will also be used as a sanity check for other heliport design criteria changes now under consideration. In FY 1990, the FAA initiated testing and analysis of a variety of vertiport design issues such as minimum parking and maneuvering areas, lighting, and marking. In FY 1991, testing and analysis on tiltrotor rotorwash concerns will be initiated. Results will support the publication of an interim vertiport design advisory circular in FY 1990 and a final vertiport design advisory circular in FY 1994. In FY 1990 through FY 1992, the FAA will continue to test and analyze a variety of heliport design issues. These include minimum required VFR airspace for curved approaches and departures, minimum parking and maneuvering areas, marking, and rotor downwash. Results will support the update of the heliport design advisory circular in FY 1992. In FY 1991, analysis of the results of the AIP funded vertiport study efforts of state and local governments will be initiated. The intent is to develop a national overview of these results and to define the expected characteristics of typical vertiports in various environments: city-center facilities (ground and elevated), metro station facility, suburban facility, etc. Results will be published in FY 1994.

Benefits:

Heliport/vertiport design criteria are part of the infrastructure that must be modified in order to make tiltrotor operations economically viable, to improve the economic viability of helicopter operations, and to maintain the safety of aircraft operations. National heliport/vertiport planning guidelines will provide the FAA with a means of making long-term capital investment decisions on Airport Improvement (AIP) funding of heliports/vertiports.

RESEARCH, ENGINEERING, AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Fiscal Year 1991

BUDGET ACTIVITY 1: AIR TRAFFIC CONTROL; SUBACTIVITY 11: HUMAN SYSTEMS AND OPERATIONS

Budget Item No.: 11(1) R,E&D Plan: 14.5
Program Title: Information Transfer and Management
Amount: $982,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	514	914	982	4,958

Basis for Request:
Investigate flight crew information requirements and flight crew/controller information transfer methods, to develop information management techniques and guidelines.

Description of Solution:
Information needs from all ground and airborne sources will be identified, classified, and prioritized to determine how and when data should be made available to the flight crew and how it should best be transferred, managed, and integrated. Analytical, laboratory, part task, and full mission simulation studies will be conducted to evaluate information transfer components and operational scenarios for both normal and emergency conditions.

Program Request:
In FY 1990, work continued on improved data entry methods. The information transfer characteristics of new instrument approach chart designs were tested and compared with baseline current charts. Requirements for data linked weather information were established. "Party line" communications benefits and liabilities were analyzed. Documentation of flight deck information needs and sources were initiated in FY 1990. In FY 1991, human factors criteria for instrument approach procedures and charts will be defined. Operational evaluations of data link applications will be conducted, and flight deck information management alternatives developed for evaluation.

Benefits:
A high proportion of incidents recorded in the aviation safety reporting system concern communications problems between flight crews and controllers. This program will improve safety and efficiency of operations in the national airspace system by ensuring that crews and controllers have the information required for decision making in an increasingly complex system, and that information transfer between ground and air is accurate and timely.

Budget Item No.: 11(2) R,E&D Plan: 14.3
Program Title: Causal Factors in Accidents and Incidents
Amount: $1,082,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	414	905	1,082	4,358

Basis for Request:
To improve the understanding of flight crew performance factors, both positive and negative, in accidents and incidents; and to develop means of minimizing the adverse effects of human errors.

Description of Solution:
Use both theory and data driven analyses to improve understanding of human error. Review literature and safety data bases to develop and validate a multidimensional model for flight crew error. Test design and procedural methods for reduction of selected classes of error in flight simulators. Synthesize sets of human factors accident and incident data from existing data bases and reports, and analyze to determine root causes of errors and error sequences involved in accidents, as well as recovery factors which prevent errors from leading to accidents.

Program Request:
In FY 1990, analyses of safety related data bases and reports continued to seek root causes of flight crew error. Simulation studies evaluated techniques for the reduction of flight management computer programming errors. In FY 1991, data base analyses and laboratory evaluations of error reduction methods will continue. Problems, trends, and recommendations will be reported to FAA operational elements for action or used to support research projects as appropriate.

Benefits:
Operators have estimated that a single wide-body jet aircraft accident can cost as much as $500,000,000. Since the majority of accidents are attributed to human error, a program to obtain a fundamental understanding of human performance aspects of accidents and incidents can pay for itself many times over by preventing a single accident.

Budget Item No.: 11(3) R,E&D Plan: 14.12
Program Title: Human Factors Applications Support
Amount: $582,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	564	1,250	582	2,358

Basis for Request:
To provide a quick response human factors research capability for near term problems; to provide human factors consulting and support for FAA research programs as required; and to assist operational organizations with the application of human factors research results in regulatory actions.

Description of Solution:
Maintain a project plan agreement with the Transportation Systems Center to: (1) provide a cadre of human factors and other specialists to conduct or manage assigned portions of FAA research programs, while quickly accomplishing short research projects as the need arises to answer operational and certification questions; (2) work closely with both FAA research and regulatory organizations to facilitate the incorporation of research results in rule making; (3) assist human factors liaison and coordination with technical committees and task forces.

Program Request:
In FY 1990, evaluations of LORAN-C non-precision approach procedures were conducted, and low-visibility takeoff performance data from a training simulator was analyzed. In FY 1991, human factors criteria for terminal area instrument procedures will be developed. A study will be conducted to define the benefits and limits of cockpit display standardization.

Benefits:
This program provides specialized research support for all of the other flight crew human factors programs, and is a particularly valuable resource in that it provides a cadre of experienced personnel who provide a quick response problem solving capability for short term issues which cannot be anticipated in time for the normal budget planning cycle.

Budget Item No.: 11(4) R,E&D Plan: 14.7
Program Title: Control and Display Technology
Amount: $882,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	333	810	882	4,358

Basis for Request:
To continually assess the potential of emerging new display and control technologies for flight deck applications, and to develop guidelines for improved flight deck displays and controls based on crew performance.

Description of Solution:
Analyses, laboratory studies, simulations, and field tests will be conducted to assess new display media, formats, and symbology. Human factors criteria will be developed for evaluating cockpit displays, controls, and alerting systems. Guidelines will be developed for electronic navigation charts. Various input and output options for interfacing with data link will be evaluated.

Program Request:
In FY 1990, laboratory testing assessed the effectiveness of various electronic navigation chart display symbology and formats. A technology survey of new input/control devices was conducted. In FY 1991, recommended standards for electronic charts will be developed. Laboratory tests will evaluate selected new technologies for flight deck applications.

Benefits:
With the increasing use of digital airborne systems and data links, a large volume of new data is becoming available for display, and more flight deck systems require programming by the flight crew. This program will enhance safety and efficiency in this increasingly complex environment by a continuing assessment and integration of new technologies to improve the speed and accuracy of data transfer between man and machine.

Budget Item No.: 11(5) R,E&D Plan: 14.11
Program Title: Flight Crew Certification and Training
Amount: $2,522,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	2,033	2,840	2,522	6,608

Basis for Request:
To develop improved techniques and strategies for airman selection, training, and evaluation; and to identify and address future requirements based on projected long-term trends.

Description of Solution:
Evaluate the effectiveness of airline training in cockpit and cabin crew coordination and resource management through analysis of crew performance data. Develop sample curricula and training aids for cockpit resource management training which can be used by smaller operators without advanced simulators. Analyze trends which will affect airman training in the long term. Analyze flight crew tasks to identify the knowledge, skills, and abilities needed for current and future operations. Evaluate applications of inexpensive simulators and part-task trainers at all levels of pilot training. Determine how advanced simulator programs can train pilots more efficiently and identify weaknesses in training.

Program Request:
In FY 1990, cockpit resource management guidelines and training aids suitable for use by regional and commuter airlines were developed. An aviation trend analysis was initiated to establish scenarios for a study of pilot and flight instructor training and certification requirements in the year 2010. In FY 1991, effective applications for low-cost training devices will be investigated. Task analyses for year 2010 airmen will identify changes in the knowledge, skills and abilities that will be required.

Benefits:
Current regulations on airman qualifications and training do not take into account the increasing use of automation, and new techniques for training. This program will enhance safety by defining selection criteria for crew members, determining skills and training requirements for new technology aircraft, developing audio/visual aids and simulator scenarios, and defining applications for simple training devices and computer based training.

Budget Item No.: 11(6) R,E&D Plan: 14.6
Program Title: Aircraft Automation
Amount: $1,082,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	0	730	1,082	4,308

Basis for Request:
To ensure that flight deck automation supports flight crews' abilities to operate advanced technology aircraft safely in both normal and emergency flight conditions; and to ensure that the evolving national aviation system and advanced technology cockpits are compatible.

Description of Solution:
Operating experience with existing aircraft and other automated systems will be analyzed to define failure modes and methods to detect and recover from these failures. Simulation studies will determine human performance using various philosophies and degrees of automation, and effects of automation on crew interaction and training needs. Functional allocation criteria and the limits to automated tasks will be defined.

Program Request:
In FY 1989, agreements with NASA were initiated to investigate the effects of flight deck automation on crew interaction, and computer aids to en route flight planning. In FY 1990, these efforts will continue and analysis of operational experience with automated systems began. In FY 1991, alternative automated configuration studies will be initiated to identify failure modes and methods for failure detection and recovery. Expert system applications for decision aiding will be evaluated.

Benefits:
A number of serious incidents have raised questions about the validity of the current philosophy of reducing human error by automating as many functions as possible. This program will enhance safety and efficiency of operations by determining automation strategies and levels which optimize human performance in the system, and developing guidelines for detection, alerting, and recovery from malfunctions.

Budget Item No.: 11(7) R,E&D Plan: 14.4
Program Title: Human Performance Assessment and Improvement
Amount: $982,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	0	930	982	4,308

Basis for Request:
To define human performance limits and capabilities for use in work station design and certification; and to provide new or improved methods and techniques to measure, assess, and improve human performance in the aviation system.

Description of Solution:
Human performance limitations will be studied and realistic performance parameters developed. The effects of such factors as fatigue, jet lag, and rest/work cycles on performance will be defined. Workload management strategies, and their effects on workload measurement techniques, will be identified and guidelines for underload and overload developed. Training and computer aids to improve strategic behavior and decision making will be investigated.

Program Request:
In FY 1990, studies addressed acceptable performance levels for specified tasks in order to develop operationally valid figures of merit for human performance. A method of identifying workload management strategies was established, and performance variables associated with underload and overload were identified. Controlled rest tests for flight crews on long over water flights were completed. In FY 1991, pilot performance and workload measures will be correlated with specific strategic behavior, and strategies typical of various tasks and environments will be classified. Workload red lines will be established.

Benefits:
The existing body of knowledge, data, and methods for assessing and predicting human performance is incomplete. This program will enhance safety by providing data on the effects of, and countermeasures for, such factors as fatigue, jet lag, stress, and disruptive work/rest cycles. Reliable workload measures will be developed, and design/certification criteria for excessively low or high workloads specified. Training concepts for workload management will be developed, along with computer aids selecting task allocation strategies.

Budget Item No.: 11(8) R,E&D Plan: 14.10
Program Title: Flight Deck Certification Criteria
Amount: $482,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	0	340	482	1,558

Basis for Request:
To develop improved standards, methods, procedures, and criteria for the certification and validation of human engineering in flight deck design.

Description of Solution:
Review and document current certification practices and criteria. Develop methodology for evaluation of the effects of introduction of new systems on the flight deck, and human performance criteria for acceptability. Develop human factors training courses tailored to the needs of certification personnel.

Program Request:
In FY 1990, work was initiated on guidelines for certification of automated systems. A human factors training course tailored to the needs of certification flight test personnel was developed and implemented. In FY 1991, current certification practices and criteria will be analyzed to form a basis for a program plan to develop improved methods and criteria.

Benefits:
Current certification policies do not adequately address the application of human factors principles in design, and there is no standard methodology for validation of human factors engineering during certification. This program will benefit safety and effectiveness of new aircraft and systems by developing a standardized process for certification of the human interfaces in new flight deck designs or new equipment retrofits, and by improving certification personnel human factors expertise.

Budget Item No.: 11(9) R,E&D Plan: 14.1
Program Title: Controller Human Factors
Amount: $1,471,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	238	780	1,471	7,003

Basis for Request:
Through basic human engineering R&D and dynamic simulation, enhance the understanding of the relationship between human factors and aviation safety and air system productivity. Develop, analyze, and maintain a concept for the human role in emerging air traffic control (ATC) systems to ensure that the intended controller functions are appropriate, effective, and can be properly supported.

Description of Solution:
The human factors implications of all aspects of proposed ATC concepts, and their associated hardware and software, will be analyzed. Each end-state concept will be examined for functional overlaps, dependencies, and automation opportunities, and as software and hardware applications are examined, the appropriateness of the distribution of tasks between the machine(s) and the controller, between controllers, and between the controller and pilot will be studied and the controller implications of all system interfaces will be considered. In addition, this project will define those areas where technology can reduce the likelihood of accidents and incidents caused by human error and will define ways in which productivity can be enhanced without sacrificing safety with particular attention to innovative ways of achieving a rapid and error free exchange of information between the controller and the ATC System's data bases.

Program Request
In FY 1990, studies were initiated for controller visual scanning patterns and controller memory enhancement. In FY 1991, these studies of scanning and memory will continue and investigations of alternative techniques for information transfer will begin.

Benefits:
The impact of the controller on the advanced ATC system(s) will be evaluated and the potential for human error reduced and productivity enhanced.

Budget Item No.: 11(10) R,E&D Plan: 14.2
Program Title: Expert Systems Application to ATC
Amount: $664,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	1,061	1,043	664	4,666

Basis for Request:
Explore and determine the technical and operational feasibility of applying artificial intelligence (AI) technology to the air traffic control (ATC) process. AI includes expert systems, intelligent tutoring systems, voice recognition, and neural nets.

Description of Solution:
Various elements of expert systems, intelligent tutoring systems, voice recognition, and neural nets are being evaluated against various potential applications within the ATC system. Examples of application areas being considered include air traffic controller training, the maintenance monitoring function, and surface control of

aircraft. Phase I Small Business Innovative Research (SBIR) contracts are being used to determine basic feasibility. Phase II SBIR contracts are being used to further develop the more promising concepts.

Program Request:
In FY 1990, a knowledge-based test bed for training ATC terminal controllers was established to validate training effectiveness in the ATC operational environment. Also in FY 1990, the simulator was expanded to begin exploring artificial intelligence applications to airspace and ATC procedural analysis capabilities. In FY 1991, research will begin to determine the applicability of AI applications to the control of aircraft on the airport surface. Additionally, the feasibility of the use of voice recognition techniques in air traffic controller training will be evaluated.

Benefits:
Increased operational efficiency through improved training techniques using AI technology.

RESEARCH, ENGINEERING AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Fiscal Year 1991

BUDGET ACTIVITY 1: AIR TRAFFIC CONTROL; SUBACTIVITY 1j: FLIGHT PLANNING OPTIMIATION

Budget Item No.: 1j(1) R,E&D Plan: 3.13a
Program Title: Dynamic Ocean Track System (DOTS)
Amount: $846,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	0	115	846	819

Basis for Request:
Develop and implement a tool for generating fuel and time efficient oceanic tracks and recommending aircraft assignments on those tracks. DOTS is designed to generate the most fuel efficient tracks for air traffic control (ATC) personnel while identifying conflict free-track loading advisors for system users.

Description of Solution:
Computer efficient algorithms have been developed which determine an aircraft's projected time and fuel consumption over the ocean given the operating conditions. Optimization techniques use these algorithms together with an automatic dynamic weather data base and varying ATC separation criteria, to design flexible fuel efficient tracks for oceanic traffic. A similar process is used to advise individual scheduled flights of the optimal track based on their oceanic entry time and other aircraft traffic they will encounter.

Program Request:
In FY 1990, flight testing in the Central Pacific airspace between the U.S. and Japan was completed to verify the projected fuel burn and time savings for the scheduled air carriers. A full prototype DOTS has been installed and operates at the Oakland Center. This prototype enables extended evaluation of track generation and aircraft loading advisories on flexible routes. Software will be rehosted on apollo computers in Oakland, Anchorage and New York centers. In FY 1991, DOTS will begin to be integrated in the Enhanced Traffic Management System (ETMS) and Oceanic Display and Planning System (ODAPS). DOTS capability will then be extended to New York and Anchorage Centers for initial flight testing. Eventually DOTS technology will be incorporated as part of the Advanced Automation System (AAS). DOTS functions are envisioned for widespread application and use over all U.S. oceanic areas.

Benefits:
DOTS will provide users with safe, fuel efficient tracks and aircraft loading recommendations. System benefits include reduced operating costs (fuel and time savings), more efficient flight trajectories, and minimization of controller workload.

Budget Item No.: 1j(2) R,E&D Plan: 3.13b
Program Title: Jet Route and Terminal Area Optimization
Amount: $250,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	0	0	250	1,600

Basis for Request:
Develop technology to determine tracks and profiles of aircraft using the air traffic control (ATC) system that minimize delays and conserve fuel. Routes and advisories for optimum CONUS traffic management to be based on system demand, separation rules, actual traffic, and current weather.

Description of Solution:
Following an initial feasibility assessment, derive technology for specific CONUS system requirements from the tested functions of the Dynamic Ocean Track System. Develop prototype and software and test under operational conditions to enable assimilation into the ATC system.

Program Request:
This is a new start in FY 1991. The initial effort will focus on completing a feasibility assessment to identify improved time and fuel-efficient routes over the CONUS. Depending on the outcome of the assessment, post-FY 1991 efforts will include developing a conceptual design and software to enable assimilation into the ATC system.

Benefits:
Manage air traffic at the best possible efficiency under any conditions of traffic demand and weather. Savings in delay costs and reduced controller workload will be the significant returns from optimizing airspace during periods of high demand.

RESEARCH, ENGINEERING AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Fiscal Year 1991

BUDGET ACTIVITY 2: ADVANCED COMPUTER; SUBACTIVITY 2a: ADVANCED AUTOMATION

Budget Item: 2a(1) R,E&D Plan: 3.15
Program Title: Advanced Automation System Program Management
Amount: $4,963,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	7,379	7,512	4,963	21,696

Basis for Request:
This activity will provide the necessary resources to manage the Advanced Automation System (AAS) program. The function and capacity of the current Air Traffic Control (ATC) System must be expanded and improved to increase capacity and improve ATC productivity. The AAS program will provide a new automation system that includes controller workstations, computer software, and processors necessary to handle projected air traffic loads in the 1990s and beyond.

Description of Solution:
A disciplined approach to project management is required to successfully implement a large and complex system such as the AAS. Resources must be provided for the entire spectrum of administrative and engineering management activities.

Program Request:
This request will provide funding to for in-house costs associated with managing the AAS program. During FY 1990, peripheral adapter module replacement factory acceptance tests were completed and a system was delivered to the FAA Technical Center. The Automated En Route ATC, Phase 2 (AERA 2) systems requirements review was completed. During FY 1991, the peripheral adapter module replacement system will be installed and accepted at the first operational site; the critical design review for the area control computer complex and tower control computer complex will be completed; and factory acceptance tests will begin for the initial sector suite system.

Benefits:
The advanced automation system will improve safety and the efficient use of the NAS, while minimizing constraints on its use. The AAS will provide the ability to handle safely the growing civil and military air traffic projected beyond the year 2000 and improve the productivity of the air traffic controllers.

RESEARCH, ENGINEERING, AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Fiscal Year 1991

BUDGET ACTIVITY 2: ADVANCED COMPUTER; SUBACTIVITY 2b: ATC AUTOMATION

Budget Item No.: 2b(1) R,E&D Plan: 3.1
Program Title: Advanced Traffic Management System (ATMS)
Amount: $5,065,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	5,439	4,683	5,065	21,475

Basis for Request:
A prototype traffic management system (TMS) is needed to develop, evaluate, and specify traffic management concepts and functions that can be incorporated into the operational traffic management system to aid in reducing delays and improving operating efficiencies. These automated functions will provide more accurate information to traffic managers and enable them to more efficiently balance airspace demand with available capacity.

Description of Solution:
The ATMS will explore concepts and functions for linking terminal, en route, and national traffic management functions to enhance traffic management capabilities and provide more precise information to system operators and users on current and projected congestion conditions. It will demonstrate capabilities for accurately monitoring the aviation system, providing alerts on projected congestion, generating alternative traffic management strategies, and distributing associated flow directives to ATC facilities. The capabilities will be developed as discrete functions for incremental implementation into the operational system. The new functions will be evaluated as they are added to the ATMS. When the new functions are operationally acceptable, the specifications will be approved, and the function will be incorporated into the TMS for operational use.

Program Request:
The initial ATMS capabilities for monitoring the national airspace system and providing alerts on current and projected overloads of system capacity have already proven to be successful in the operational TMS. This request is to complete the development of the automated demand resolution function which automatically provides traffic management alternatives for resolving identified imbalances between demand and capacity. These alternatives, which may include rerouting, flow rate adjustments, or ground delays, will enable the traffic management specialist or automated system to select the flow strategy that best achieves the desired overall system performance. Prototype algorithms for this function were designed and incorporated into the ATMS for evaluation in FY 1990. During FY 1991 the testing and refinement of these algorithms will be completed. When the operational feasibility of this new function has been demonstrated, the specifications will be finalized so the function can be incorporated into the operational TMS. This effort will include integration of improvements to the source data used for ATMS modeling to improve the accuracy of the predictive and demand resolution algorithms. Initial concept and design studies for the strategy evaluation function were initiated during FY 1989. Design of the necessary software must be started inFY 1991. An oceanic traffic management study was initiated in FY 1990. It will be continued in FY 1991. It addresses flow management issues related to oceanic airspace. Functional and operational requirements for improved oceanic traffic management will be defined. The objective is to develop an integrated domestic and oceanic flow management system.

Benefits:
Reduce delay and increase efficiency of aircraft operations through the ability to more accurately allocate traffic demand to available system capability.

Budget Item No.: 2b(2) R,E&D Plan: 3.3
Program Title: Automated En Route Air Traffic Control (AERA 3)
Amount: $8,582,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	3,977	5,173	8,582	35,858

Basis for Request:
AERA 3 is intended to capitalize on the capabilities put in place by the Advanced Automation System (AAS) to better accommodate user preferred flight trajectories and more fully utilize available en route airspace capacity. The accomplishment of these goals requires more direct control of air traffic by the automation as opposed to the automation providing more advice and guidance to the air traffic controller.

Description of Solution:
AERA 3 will use the AAS computers and additional software to monitor the planned flight profiles of all controlled traffic for potential conflicts, to calculate resolutions for predicted flight path conflicts, and to communicate clearances to the aircraft to assure safe, fuel-efficient aircraft operations. Overall traffic flow strategies will be established by the Airspace Manager (AM) (formerly the controller) and implemented by the automation on an aircraft specific basis. AERA 3 will make use of a closed-loop command and control system between the air traffic control (ATC) computer and aircraft flight management systems.

Program Request:
In FY 1990, the preliminary AERA 3 system-level specification was produced. Additionally, experimentation and rapid prototyping laboratory evaluations were conducted to examine the major operational and technical implications of a highly automated ATC system. In FY 1991, the development and refinement of the AERA 3 algorithms will continue and modeling will begin to evaluate system performance. The operational concept defining the role of the AM will be produced in FY 1991.

Benefits:
Flight time and fuel savings from more direct routing, greater accommodation of user-preferred fuel efficient routes, improved levels of system safety, and increased controller productivity through greater automation and use of data link.

Budget Item No.: 2b(3) R,E&D Plan: 3.2
Program Title: Dynamic Special-Use Airspace Management
Amount: $531,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	539	410	531	1,620

Basis for Request:
Develop procedures and define automation requirements for increasing flexibility in dynamic special-use airspace (DSUA) allocation and use. The FAA is working closely with DOD, which has the lead in developing a military airspace management system.

Description of Solution:
The activation and release of DSUA, such as restricted airspace and military operations areas, are currently limited by several factors, including manual interagency coordination. The allocation and control of DSUA are therefore not always totally responsive to either military or civilian needs. New air traffic control (ATC) procedures and the necessary automation requirements will be developed for improved management of DSUA.

Program Request:
Interagency coordination procedures were examined in FY 1989 to identify functional and performance requirements for a more dynamic DSUA management function. A draft report on DSUA operational procedures, current limitations, and recommendations for improvement was completed in FY 1990. This report will form the basis for further development activities and for integration with the national ATC flow management process. In FY 1991, requirements will be developed for the data base structure and communications necessary to dynamically manage DSUA. In FY 1991, requirements will be developed for the necessary ATC automation at both the ATMS and AAS levels to support improved DSUA operational procedures.

Benefits:
Increase the flexibility in the use and assignment of special use airspace to both military and civilian users.

RESEARCH, ENGINEERING, AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Fiscal Year 1991

BUDGET ACTIVITY 3: NAVIGATION; SUBACTIVITY 3a: NAVIGATION

Budget Item No.: 3a(1) R,E,&D Plan: 5.4
Program Title: GPS Utilization
Amount: $1,581,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	1,000	1,030	1,581	6,884

Basis for Request:
Evaluate methods to increase the utility of the Global Positioning System (GPS) to civil aviation.

Description of Solution:
A variety of methods for increasing the utility of GPS in civil aviation will be assessed. The more promising methods will be carried forward through analyses and later to hardware evaluations. Methods that will be assessed include: (1) further investigation of the interoperable use of Loran-C and GPS as a single navigation aid and the potential to meet requirements as a sole means of navigation in the NAS, (2) investigation of applications of differential GPS where high accuracy is needed, and (3) consideration of enhancements of the GPS Integrity Monitor System. Methods also will be investigated for management of airborne data bases to ensure that aircraft and air traffic control personnel are using common reference information.

Program Request:
A report on the interoperable use of Loran-C and GPS was delivered to Congress in September 1989. In FY 1990 additional theoretical investigations of the concept were conducted. In FY 1991 procurement of a test unit that incorporates the theoretical concepts will be started with initial tests in FY 1992 and later. An evaluation report will be published. Applications of differential GPS in aviation will be examined in FY 1991 with tests planned for FY 1992 and FY 1993 when full GPS signal coverage is available. A test report on differential GPS will be published. The specification of the GPS Integrity Monitor System will be completed in FY 1991; at that point examinations of concepts for enhancement or additional uses of the system will be initiated. When completed a report on results of the examinations will be considered for implementation. An analysis will be made of airborne data bases and the means by which they are updated. A report will conclude whether more uniform management and update methods might be used and make recommendations for implementation.

Benefits:
Integrated Loran-C/GPS avionics might be useable as a sole means of navigation in the NAS. Differential GPS applications may meet some vehicle location requirements at smaller airports at minimal costs. Enhancements of the GPS Integrity System will improve performance or add functions after the basic purpose of the system is met. The FAA will have a better view of the expanding area of airborne data bases after the planned evaluation is completed.

Budget Item No.: 3a(2) R,E&D Plan: 5.3
Program Title: Navigation Systems Development
Amount: $882,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	377	460	882	3,558

Basis for Request:
The purpose of this program is to identify and evaluate emerging technologies and new concepts for application in the evolution of navigation services to satisfy future requirements. This project supports the biennial revision of the Federal Radionavigation Plan (FRP) and provides the FAA input to the DOT/DOD Navigation Working Group. Possible future navigation systems will be examined as either extensions of or alternatives to existing and planned navigation systems, with the goal of satisfying projected user requirements. National aviation standards for radionavigation systems are prepared and maintained as part of this program.

Description of Solution:

Future navigation systems will be subjected to a total system analysis that addresses safety, economic performance, and operational and technical issues. As a minimum, these future systems should:

- o Meet the service needs of the aviation community.
- o Be responsive to changing operational and technological environments.
- o Accommodate a necessary degree of standardization and interoperability for both domestic and international operations.
- o Meet the required level of service in a cost-effective manner.

Algorithms and potential systems will be developed and applied in laboratory simulations to test the effectiveness of proposed concepts (e.g., geostationary satellite system one-way ranging systems). The relative merits and deficiencies of different systems will be measured against requirements. Based on results, technical and functional design specifications will be developed for the recommended system. Also, a national aviation standard will be prepared and maintained for each system approved for use in the national airspace system (NAS). Supplemental studies and analyses will be performed as necessary to support the FAA input to the DOT/DOD Navigation Working Group. This input will refine recommendations published in the FRP on the mix of systems needed to satisfy civil aviation requirements.

Program Request:

In FY 1990, a new edition of the FRP was published. In addition, work continued to prepare for the use of the DOD Global Positioning System (GPS) by civil aviation. In particular, definition of a ground-based system for GPS integrity monitoring was completed in FY 1990. Efforts continued to (1) develop a GPS notice to airmen (NOTAM) information system, (2) keep current on the coverage of GPS and GLONASS (the USSR Global Orbiting Navigation Satellite System (GLONASS), which is similar to GPS), (3) investigate methods for GPS Receiver Autonomous Integrity Monitoring (RAIM), (4) draft a National Aviation Standard for GPS, and (5) support the Radio Technical Commission for Aeronautics (RTCA) in preparing a Minimum Operational Performance Standards (MOPS) for GPS. Other GPS work will continue to pursue GPS and combinations of GPS-GLONASS and GPS-LORAN-C as sole means of navigation by the mid-to-late-1990's. In FY 1991, the GPS NOTAM system will be defined and a draft MOPS for GPS is expected from RTCA.

Benefits:

The application of GPS will result in improved system performance with worldwide all-weather coverage. The improved accuracy will contribute to the reduction of some oceanic separation standards resulting in improved operational economy.

Budget Item No.: 3a(3) R,E&D Plan: 5.1

Program Title: Navigation Systems Engineering

Amount: $896,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	1,152	1,140	896	3,055

Basis for Request:

Expand the utility, improve the performance, and increase the efficiency of navigation systems currently operated and maintained by the FAA. Aid in the orderly integration of evolving airborne navigation technology into the national airspace system.

Description of Solution:

An assessment will be conducted for potential reduction of operating costs, enhancement of performance, or addition of new functions to ground-based navigation aids now operated by the FAA. Available technology will be identified and the applicability to navigation aids that would improve performance or meet new requirements will be examined (e.g., improving the very high frequency omnidirectional range (VOR) antenna system to reduce sensitivity to the site environment). The technical feasibility and potential benefit of adding functions within the VOR, distance measuring equipment (DME), or nondirectional beacon (NDB) radio frequency spectra, without degradation of existing service, will be considered (e.g., the use of spread-spectrum techniques to transmit navigation data to aircraft). Potential enhancements with the greatest apparent merit will be evaluated in simulated operations. Validation of these enhancements will be accomplished through use of prototype hardware and software developed for limited operational evaluations (e.g., the application of one-way ranging techniques to DME). Based on the results of the tests and evaluations, equipment specifications and procurement information packages will be developed. Performance standards and certification guidance will be developed for user avionics equipment in relation to the any changes or additional functions integrated into navigation aids.

Program Request:
In FY 1989, the assessment of navigation aids was started. In FY 1990, the assessment was completed and narrowed to the most feasible concepts. Two promising concepts are technological improvements to VOR antenna and using advanced data transmission techniques in the VOR support navigation functions. In FY 1991, the design of test units for selected concepts will be started and the designs will be completed in FY 1992. In FY 1993 and FY 1994, test units will be assembled, tests conducted, reports written, and equipment specification and procurement information developed.

Benefits:
Application of new technologies will result in improved system performance. Additional service within existing frequency spectra may be possible.

RESEARCH, ENGINEERING, AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Fiscal Year 1991

BUDGET ACTIVITY 4: AVIATION WEATHER; SUBACTIVITY 4a: AVIATION WEATHER

Budget Item No.: 4a(1) R,E&D Plan: 7.5
Program Title: Central Weather Processor (CWP)
Amount: $1,653,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	8,307	6,587	1,653	3,100

Basis for Request:
Develop, test, and evaluate required CWP interfaces to other elements of the national airspace system (NAS) in order to realize the full potential of the CWP to disseminate real-time weather information for pilots and air traffic controllers.

Description of Solution:
The CWP will provide time-critical information on hazardous and operationally significant nonhazardous weather to the Advanced Automation System for use by air traffic personnel. In addition, through interfaces to the real-time weather processor (RWP), a subset of these products will be transmitted to the data link processor (DLP) for uplink to pilots via Mode-S. In addition, the RWP will provide these products to the meteorologist weather processor (MWP), which will provide the center weather services unit (CWSU) meteorologist's, with a capability to display and manipulate these weather products in its data base, as a complement to the MWP.

Program Request:
In FY 1989, initial requirement definition studies were started on the RWP interface with the second generation MWP. This work continued through FY 1990 and the focus in FY 1991 will be on the completion of these studies as well as the continuation of work on defining interface requirements, specifications and the second generation MWP requirements.

Benefits:
These interfaces will enhance the benefits of the CWP to reduce the impact of weather on flight operations within the NAS system and increase safety by providing better and faster weather information to controllers, pilots and traffic management specialists.

Budget Item No.: 4a(2) R,E&D Plan: 7.6
Program Title: Icing Forecasting Improvements
Amount: $982,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	0	900	982	5,005

Basis for Request:
Provide an improved operational capability to detect, monitor, and forecast aircraft icing by 1996.

Description of Solution:
The project will study the ability of new generation remote sensors to detect icing conditions, evaluate current and new icing forecasting techniques, and provide the technology transfer necessary to implement the best techniques into the day-to-day operations of the National Weather Service (NWS). This research is a cooperative effort with the FAA, NOAA, NASA, DOD, and the National Science Foundation (NSF). The NSF will carry out the program defined by the National Plan to Improve Aircraft Icing Forecasts which was developed by the National Center for Atmospheric Research (NCAR). This plan was completed in FY 1989. It advocates the use of unique NOAA and NCAR weather measurement facilities in the Denver/Boulder, CO. area, including specially instrumented research aircraft, to construct comprehensive data sets for the development and verification of forecasting techniques. The data collected will also be a valuable resource for use in improving aircraft design and certification standards, icing protection systems, and pilot training. This program is divided into three phases:

Phase I	improvements in the detection of icing conditions and in short-term (up to 4 hours) forecasting.
Phase II	will be a two-year effort aimed at further improvements in both short- and long-term (4 to 12 hours) forecasting.
Phase III	is a one-year effort to adopt the new forecasting techniques in all regions of the national aviation system and apply them to the daily operations of the FAA's weather services.

Program Request:
Starting in FY 1990, and continuing through the current fiscal year, the program entered the field test phase where research aircraft and the NOAA's experimental mesoscale remote sensing facilities were used to: (1) study the ability of remote sensors to detect icing conditions, (2) evaluate current icing forecasting techniques, and (3) test promising new techniques began Phase I of a three-year field test.

Benefits:
Provide an improved operational capability to detect, monitor, and forecast aircraft icing by 1996.

Budget Item No.: 4a(3) R,E&D Plan: 9.2
Program Title: Airborne Windshear Detection and Avoidance
Amount: $1,041,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	1,269	1,080	1,041	0

Basis for Request:
Reduce aircraft exposure to severe low-altitude windshear by using airborne detection, warning, and avoidance.

Description of Solution:
Develop the requirements for airborne windshear systems that will enable the flight crew to reliably detect and avoid hazardous windshear along the intended flight path. There are three project elements that support the effort: hazard definition, sensor assessment, and flight management and integration. The project is being accomplished through a cooperative effort with the National Aeronautics and Space Administration. National resources and facilities are involved, including the aircraft landing dynamics facility, aircraft simulation capabilities, the ability to perform four-dimensional mesoscale atmospheric modeling and analyses, and fully instrumented flight test facilities. The technology will be transferred to manufacturers and operators in order to accelerate their development and certification programs. This technology transfer is being accomplished through annual public workshops and joint ventures with manufacturers.

Program Request:
In FY 1990, a flight evaluation of an airborne-qualified radar scatterometer was initiated to quantify ground clutter in a windshear environment and validate design analysis. In FY 1991, system requirements describing an integrated system concept for forward-looking windshear sensors for aircraft will be completed.

Benefits:
This program established the unified, quantitative system requirements that are used by manufacturers and certification personnel for airborne windshear equipment.

Budget Item No.: 4a(4) R,E&D Plan: 7.3
Program Title: Expanded Low-Level Windshear Alert System
Amount: $500,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	258	1,093	500	0

Basis for Request:
Improve the performance of the Low-Level Windshear Alert System (LLWAS) by developing and testing scientific algorithm refinements. These refinements specifically address the mitigation of nuisance alarms caused by turbulence and Chinook wind conditions. Develop and test LLWAS network designs and scientific algorithms for mega-airports; e.g., the new airport at Denver and for extending the coverage of current LLWAS to three miles from the runway threshold. Develop and test LLWAS interfaces to terminal

NEXRAD and the Terminal Doppler Weather Radar (TDWR). Develop and test statistical concepts for maintenance diagnostics and remote maintenance monitoring. Prepare a specification for an LLWAS wind sensor replacement which performs well in icing conditions.

Description of Solution:
Continue an interagency agreement with the National Science Foundation to have the National Center for Atmospheric Research (NCAR) develop and test LLWAS network designs and scientific algorithms for mega-airports and the three-mile extension. Have NCAR develop and test algorithm refinements for the mitigation of unisance alarms and the Doppler interfaces. Continue funding support to have the FAA Technical Center complete development and testing of statistical concepts for remote maintenance monitoring. Continue funding to have the Transportation Systems Center complete a specification for a wind sensor replacement.

Program Request:
Work initiated in FY 1990 will be completed in FY 1991 to refine and test an LLWAS/TDWR interface using a test bed at Orlando, Florida. This effort will define the requirements to allow the full integration of the two systems at airports where they are scheduled to be colocated.

Benefits:
Provides more timely and accurate windshear information to controllers and pilots thereby enhancing aircraft safety at major terminals.

Budget Item No.: 4a(5) R,E&D Plan: 7.4
Program Title: Windshear Terminal Information System Integration
Amount: $641,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	387	531	641	6,095

Basis for Request:
Develop and demonstrate the flight crews' windshear information system requirements. Define the flight crews' information system requirements using airborne and ground-based data to improve the flight crews' executive decision-making in hazardous terminal area windshear environment. Support ground systems' requirements.

Description of Solution:
Use of advanced technology airborne and ground-based sensors. Determine the ground-derived information delivery requirements. Airborne sensor data requirements to the ground systems. Assess current data-link capabilities and exploit emerging data-link capabilities. Ground and air derived sensor information fusion for flight crew decision-making. Information requirements definition is centered on the flight crew. Establishing operational guidelines in concert with industry.

Program Request:
In FY 1990, concepts for automated direct broadcast of windshear data were tested using piloted simulators. Concepts were narrowed down to those that could be implemented for piloted flight evaluations. In FY 1991, criteria for information management, format, and content of automated direct broadcast of windshear data will be developed through Industry/Government working groups and evaluated. This criteria will be used to developed and integrated into piloted flight tests and demonstrations involving advanced airborne windshear technology. Along with advanced airborne technology, ground-based technology will be available for use in FY 1992 time-period.

Benefits:
The technology will be transferred to the national airspace system managers, aircraft and avionics manufacturers, and aircraft operators in order to accelerate their development and certification programs.

Budget Item No.: 4a(6) R,E&D Plan: 7.2
Program Title: Terminal Weather Radar
Amount: $2,022,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	1,338	1,878	2,022	3,180

Basis for Request:
Improve aviation safety by utilizing Weather Radar at major airports to detect windshear and other hazardous weather conditions.

Description of Solution:
The Terminal Doppler Weather Radar (TDWR), presently being procured with Facilities and Equipment (F&E) funds is designed to accept additional weather products through software changes. No hardware need be changed to revise or add new weather products. The additional weather products expected to be added after initial implementation are: (1) prediction of the formation of microbursts, (2) turbulence detection, (3) tornado detection, and (4) storm movement prediction. Generation of these weather products requires data collection and analysis from multiple geographic locations, algorithm development, algorithm test, and algorithm documentation.

Program Request:
In FY 1989, the microburst prediction algorithm concept was developed. In FY 1990, this algorithm was tested using data from Memphis, Huntsville, Denver, and Kansas City. This algorithm was also documented for incorporation into the TDWR. The addition of a microburst prediction algorithm to the TDWR will give pilots advance warning of hazardous windshear formation thereby increasing safety and allowing more orderly traffic management. In FY 1991, a turbulence detection algorithm will be tested and documented. This algorithm will warn pilots of the presence of severe turbulence.

Benefits:
The TDWR improves safety through the detection of hazardous windshear and in addition reduces delays by providing an advance indication of wind shifts at airports.

Budget Item No.: 4a(7) R,E&D Plan: 9.4
Program Title: Airborne Windshear Advanced Technology
Amount: $900,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	0	0	900	4,814

Basis for Request:
Demonstrate and evaluate radar, lidar, infrared, and next generation reactive system performance against known atmospheric variables using a large, transport category aircraft operating in the National Airspace System (NAS).

Description of Solution:
The project is being accomplished through a cooperative effort with the National Aeronautics and Space Administration to demonstrate and characterize the remote windshear measurement performance of airborne sensors over their intended operational range. The focus of this effort is demonstrating the practicality of airborne sensor technology for flight crews' executive level predictive windshear warning. This program will provide sufficient engineering data and design guidelines for use in industry production, FAA certification standards, and integration into the NAS. There are two main program elements: Systems Performance Evaluation, and Flight Management Requirements Definition.

Program Request:
In FY 1990, the industry participated in Government evaluations of available sensor concepts, which provided criteria to write functional specifications for hazard characterization, and standardized test methodologies for use by the industry. In FY 1991, flight test program documentation will be started, along with the establishment of piloted flight test support logistics for an integrated airborne windshear detection system. Radar clutter- and weather-data collection, and the lidar final design review will be initiated.

Benefits:
The focus of this effort is demonstrating the practicality of airborne sensor technology for flight crews' executive level predictive windshear warning. This program will provide sufficient engineering data and design guidelines for use in industry production, FAA certification standards, and integration into the NAS.

RESEARCH, ENGINEERING, AND DEVELOPMENT
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BUDGET ACTIVITY 5: AVIATION MEDICINE; SUBACTIVITY 5a: AVIATION MEDICINE

Budget Item No.: 5a(1) R,E&D Plan: 12.4
Program Title: Aeromedical Program Support
Amount: $656,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	531	452	656	4,778

Basis of Request:
Improve aviation safety by ensuring the health of flyers through the medical certification program and educational efforts. Improve agency work force safe performance and efficiency by providing healthful work environments for agency employees, and by ensuring that key agency personnel with critical safety responsibilities are medically qualified to perform their jobs.

Description of Solution:
Studies will be undertaken to develop specific data needed by the Federal Air Surgeon. Development of educational material for use by other programs within the Office of Aviation Medicine. Review of Part 67 of the Federal Aviation Regulations which will result in recommendations for rulemaking as required by the Administrative Procedures Act. Special studies in response to National Transportation Safety Board, industry and the Federal Air Surgeon to determine potential crew incapacitation and medical factors associated with aircraft accidents, and revised standards for evaluating medical criteria and procedures.

Program Request:
In FY 1990, the following were continued: (1) studies relevant to therapeutic drugs that directly impact piloting performance; (2) evaluation of other new vision corrective devices; (3) expansion of studies of chemical abuse in pilots; (4) field tests of prototype cognitive function tests and (5) documentation of occupational health relevance of microwave exposures to FAA workers. These efforts will provide support to regulatory decisions, national educational efforts, evaluation of medical criteria and procedures, revision of standards of medical certification, and enhance safety and productivity. In FY 1991, Aeromedical Program Support will continue to support medical regulatory processes, conduct special studies in response to the National Transportation Safety Board, industry and the Federal Air Surgeon to determine potential crew incapacitation and medical factors associated with aircraft incidents/accidents, evaluate therapeutic drugs that directly impact piloting performance, and conclude field studies of prototype cognitive function test devices.

Benefits:
Increased awareness of physiological factors associated with accidents and consequent actions by the agency to correct areas within its certification purview. Reduction in damages to aircraft and facilities, reduction in injury and loss of life in accidents. More relevant airman and ATC's medical certification procedures with possible reductions in time and money costs to the affected population.

Budget Item No.: 5a(2) R,E&D Plan: 12.3
Program Title: Protection and Survival
Amount: $2,093,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	2,227	2,275	2,093	11,758

Basis for Request:
Promote optimal accident/incident survival by developing and assessing the efficiency of systems, standards, procedures, and concepts.

Description of Solution:
Protection and survival research will continue in the four broad areas of crashworthiness, protective breathing, water survival, and cabin safety research. Aviation Medicine's protection and survival research efforts directly or indirectly relate to emergency equipment and procedures and support rulemaking or certification actions by evaluating merits, deficiencies, cost and benefits of specific safety-related appliances and promote proper use of these appliances through educational initiatives, in cooperation with industry and airspace users.

Program Request:
In FY 1990, the following efforts were completed: (1) first phase of an expanded detailed evaluation of water survival equipment including the effectiveness of current and proposed infant personal flotation devices; (2) initiation of field-oriented verification of new seat and restraint system crashworthiness standards; (3) generation of computerized models of cabin evacuation process; (4) updating of the anthropometric values for the flight attendant population; and (5) exploration of combustion product concentration related to physical incapacitation of the proposed 5+35 minute protection limits for passenger protective breathing equipment. These efforts will provide support to regulatory decisions, provide greater standardization and understanding of performance testing for proposed crashworthiness standards, and provide state-of-the-art techniques for evaluation of the cabin evacuation process and promote educational initiatives throughout agency, industry and airspace users and provide means to improve safety. In FY 1991, Protection and Survival research will continue to focus on near and long-term regulatory initiatives for potential improvements in seat and restraint systems, developing tests to provide data on new technologies in accordance with regulatory requirements to reflect concepts of civil airman and passenger tolerance. These include: (1) development of viable and cost-effective water survival concepts and procedures, including standards for flotation platforms and airport water rescue requirements such as aircraft and rescue equipment compatibility; (2) improved standards for protective breathing equipment used by aircraft crews; (3) development of toxicological profiles on burning cabin interior materials; (4) study motivational factors in the use of shoulder harnesses by general aviation pilots; and (5) updating of an authropometry data base to support protective equipment development.

Benefits:
Reduction in injury and loss of life attributable to failure of seats and restraints in aircraft impacts; reductions of failure of passengers to complete timely evacuation of aircraft following accidents; and reduction of drowning from failure to obtain and use individual flotation devices, or other water survival equipment.

Budget Item No.: 5a(3) R,E&D Plan: 12.1
Program Title: Work Force Optimization Research
Amount: $2,114,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	1,332	1,570	2,114	12,760

Basis for Request:
Increase the efficiency, productivity and safe performance of agency personnel through the application of human factors research, while at the same time maintaining or enhancing positive employee attitudes.

Description of Solution:
Develop data bases and tracking systems to monitor and evaluate personnel selection, training and performance effects. The data will be acquired from such sources as test scores, operational error counts, supervisory ratings, demographic characteristics, training results, and subordinate appraisals.

Program Request:
In FY 1990, the following efforts were completed: (1) validation and evaluation studies of air traffic control specialist (ATCS) screening and training programs; (2) validation and evaluation of Airway Facility (AF) and Air Traffic (AT) Supervisory Identification and Development (SIDP) program; (3) remedial training of Aviation Safety Inspectors; and (4) a survey of pilot satisfaction with FAA flight plan and weather briefing services in the Montgomery County AFSS flight plan area. These efforts will provide databased information for management to make decisions concerning selection, training and evaluation of personnel. Improved methods and techniques in these areas will result in improved safety and heightened productivity. In FY 1991, the Human Resources Research Division will continue evaluation and validation of selection and training programs. Identification of potential selection instruments for the future automated ATC system, management assessment of job satisfaction of FAA employees development to accommodate other occupations in the agency moving to a SIDP process to select first line supervisors and developing qualified managers, and methods for managing fatigue due to various stressors in pilots and ATCS's.

Benefits:

Improvements in screening tests, training programs and knowledge of environmental stresses will aid in reducing initial training failure rates and will increase the probability of future retention of Air Traffic Control Specialists and Aviation Safety Inspector (ASI) Specialists. Also, standardization of selection and training procedures for ATCS's and ASI's will result in enhanced aviation safety.

Budget Item No.: 5a(4) R,E&D Plan: 12.2
Program Title: Human Performance Research
Amount: $714,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	791	678	714	8,577

Basis for Request:

Enhance understanding of the human function in the complex environment of air traffic control (ATC) and cockpit systems in support of agency rulemaking activity.

Description of Solution:

Field and laboratory studies of airman and air traffic control specialists (ATCS) performance will be conducted. These studies will examine the relationships between human performance and several human factors variables such as workload, equipment design characteristics, specialized training, and management actions. Field studies will focus on performance of personnel under actual on-the-job conditions. Laboratory studies will examine performance under simulated or controlled experimental conditions. Various types of assessments of the workload and performance of ATC personnel has been a focus of active scientific study for some time and it is now possible to measure productivity objectively through task analyses and simulation.

Program Request:

In FY 1990, the following were completed: (1) job task analysis and task knowledge requirements for ATC positions; (2) methodologies developed to identify job tasks associated with operational errors; (3) field studies and recommendations for collection of information and possible remedial training for ATCS; (4) a survey of visual requirements associated with color-coded displays in advanced ATC and pilot work stations. These efforts will provide job task analysis and identification of task knowledge requirements for the ATC positions, analysis of operational errors and job tasks involved in their occurrence and the identification of relationships between operational errors and demographic variables, selection scores and training performance which could provide a means to improve safety. In FY 1991, efforts will continue research and assessment of the general characteristics of an advanced automation ATC system and make realistic estimates of associated workload. Based on a systematic data analysis, this project will attempt to identify work conditions that lead to boredom, inattention, stress, and fatigue. Methods for reducing or eliminating these effects will be tested; a major initiative will be the development and validation of objective means for measuring specific aspects of controller performance to provide a baseline for future workload and error assessments and a possible field evaluation tool; feasibility studies at radar training facilities will result in a standardized computer-based system for performance measurement. Job-related visual acuity and color vision tests for future ATC and pilot work environments will be developed and validated. Additionally, advanced automation cockpit displays will be evaluated to identify human factors issues most closely associated with errors in performance. Data bases and methods supporting the evaluation of pilot certification requirements and pilot/controller miscommunication will be established, and initial analyses completed.

Benefit:

Human error plays a prominent role in nearly all of the controller operational errors and a majority of pilot incidents/accidents. These laboratory and field human factors investigations of controller/pilot performance will enhance aviation safety through work station modifications and improved training and certification procedures, and by assuring that pilot and controller visual standards are adequate for the tasks they perform. Advisory and educational materials developed on the basis of these findings will also improve pilot/controller performance through better decisionmaking, communication, and coordination with a concomitant reduction in errors/accidents.

Budget Item No.: 5a(5) R,E&D Plan: 12.5
Program Title: Aging Aircraft - Human Factors
Amount: $896,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	1,216	1,475	896	5,900

Basis for Request:
Enhance understanding of human needs and limits in the performance of airplane maintenance and inspection tasks.

Description of Solution:
Perform field and laboratory studies of the activities of maintenance and inspection personnel. Determine critical or error-prone tasks and task elements. Relate these to such factors as training, communication, work environment or task design. Devise recommendations to reduce error through application of remedial measures such as improved equipment design, training methods, or communication methods.

Program Request:
In FY 1990, the following efforts were completed: (1) first phase of laboratory studies focusing on factors affecting the accuracy of non-destructive testing (NDT) inspection (2) development of methodologies to identify job tasks (3) first phase studies on error analysis, training, work environment, equipment design, human limitations and selection placement and motivation issues (4) continuation of conferences conducted to address communication factors including methods for writing service bulletins and airworthiness directives, optimal communication modes for training and work task communication. These efforts are part of an agency-wide, NASA and industry effort to provide improved safety of the aging aircraft. In FY 1991, Aging Aircraft - Human Factors research will continue to focus on job task analyses, development of error classification systems, studies of simulator based training methods, analyses of work environment, and development of selection and placement methods.

Benefits:
Reduction in accidents and incidents in air carrier operations attributable to maintenance and inspection human factors. Better understanding of these variables will lead to enhanced training methods, and improved human engineering of equipment.

RESEARCH, ENGINEERING, AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
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BUDGET ACTIVITY 6: AIRCRAFT SAFETY; SUBACTIVITY 6a: AIRCRAFT SAFETY

Budget Item No.: 6a(1) R,E&D Plan: 11.1
Program Title: Aircraft Systems Fire Safety
Amount: $5,001,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	4,398	5,430	5,001	24,579

Basis for Request:
Minimize fire-related injuries and increase survival rates for aircraft occupants during in-flight and post-crash fires. Improve ability to detect and suppress aircraft fires. Decrease the potential for ignition of aircraft materials.

Description of Solution:
The program primarily uses full-scale fire tests both to characterize the fire environments that can occur with aircraft and to quantify the effectiveness of design improvements or alternate fire-fighting technologies. Studies are conducted to determine airplane design characteristics as related to fire incidents, projected benefits of proposed improvements and fleet-wide costs of new improvements. New or improved laboratory fire test methods are developed for regulatory implementation of findings from full-scale fire tests. Research is performed on more fundamental aspects of material flammability, extinguishment chemistry and fire dynamics in order to develop promising fire safety improvements for future full-scale test validation.

Program Request:

Onboard Cabin Water Spray System
In FY 1989, testing of the British-provided nozzles was initiated in a narrow body aircraft fuselage. In FY 1990, additional testing was done in a wide-body fuselage for several fire scenarios to measure the additional time available for escape provided by water mist fire suppression. Concurrent with these tests, the British and Canadian governments are funding contracts to study adverse aspects of a cabin water spray system, such as accidental activation and any detrimental effects on rapid passenger evacuation. In FY 1991, the results of the full-scale tests along with the systems studies will be used to develop an optimized water spray system.

Halon Replacement Guidelines
The primary agents for aircraft portable and fixed fire extinguishers are Halon 1211 and 1301. Both are to be limited in or removed from production based on international treaty to protect the stratospheric ozone. These agents attained their present aviation status through over thirty years of test and evaluation on safety and effectiveness by the FAA. In FY 1990, a multi-year effort was initiated to develop halon replacement guidelines. A study was initiated to scope the impact of decreased halon availability on civil aviation. Additionally, existing test facilities will be modified so that the effectiveness of alternate agents can be compared to halon capabilities. These tests will include hand extinguishers, cargo compartment fixed systems and engine nacelle installation. In FY 1991, tests of alternate or promising new agents will continue.

Auxiliary Fuel Tank Protection
Auxiliary fuel tanks installed in the pressurized hull of the aircraft have become more widely used. These installations give an aircraft added flexibility for using it on routes of varying ranges. In FY 1990, full-scale fire tests were performed to determine the vulnerability of these installations to in-flight and post-crash fires and the effect of their involvement in fire on survivability in the passenger cabin. In FY 1991, the testing will be directed at reducing the entry of smoke and flames through passenger floor vents and examining the need for improved fire resistance of floor materials.

Cargo Compartment Fire Safety
In FY 1990, the cargo compartment effort focused on Class B cargo compartments to support current regulatory efforts in this area. Class B compartments are typically main deck rather than below floor compartments found in "Combi" aircraft. The work will involve full-scale tests to evaluate procedures that will be proposed by manufacturers to be used with the retrofitted systems required by upcoming regulations. In FY 1991, the cargo compartment work will be redirected at two specific areas. Tests

will be performed on the hazards associated with flammable aerosol propellants when used in spray cans stored in passenger luggage. Additionally, the capabilities of currently employed cargo compartment smoke detectors will be determined against a range of smoke types to assess their overall effectiveness.

Seat Compartment Fireworthiness

The incorporation of "fire blocking layers" on polyurethane seat cushions reduces the heat production from individual seats when exposed to fire. This improvement does not address the flammability of other components such as trays and armrests. In FY 1989, fire tests were completed to see if improvements in seat components were warranted. In FY 1990, appropriate bench scale test methods were investigated. In FY 1991, a data package on the flammability characteristics of seat components will be completed.

Oxygen Systems Safety

In FY 1990, an evaluation of in-service incidents was be conducted to define the potential fire hazards of cabin onboard oxygen systems both as to their participation in the onset of a fire and to their vulnerability to existing fires. This study will provide a basis for the development of full-scale test scenarios.

Fuselage Structural Fire Safety

In FY 1989, full-scale fire tests of fuselage burnthrough were completed in both landing gear up and landing gear down configurations. In FY 1990, the results of these tests were analyzed for the fuselage vulnerability to an external fuel fire when aluminum structure is involved.

Computer-Assisted Emergency Management

This project consists of the application of flight deck computers, integrated fire detectors and knowledge of in-flight fire growth characteristics to develop an Aircraft Command in Emergency Situations (ACES) hardware/software system to advise the crew as to the best course of action during an in-flight fire. A design requirements study contract was awarded in FY 1989. In FY 1991, a prototype will be installed in a test fuselage for full-scale fire tests. The fuselage will be a ground-based test article with ventilation air simulating interior air movement as in flight. The product of this work will be demonstration of this system to aid a flight deck crew in a more rapid and proper response to in-flight fire emergencies.

Low Pressure Flammability

Low-pressure flammability addresses the question as to whether an in-flight fire can be managed to any degree through control of the cabin pressure. In FY 1991, correlations will be developed for the effects of pressure at varying altitudes above sea level on burning rates of various cabin furnishing material as well as typical materials found in luggage. This information will be used to plan future full-scale fire tests at reduced pressures. The product of this work would be advisory material for emergency procedures.

Benefits:

By developing improved fire test requirements or fire safety design criteria for possible incorporation into new or upgraded advisory circulars or regulations, this effort will improve the fireworthiness of civil aircraft and reduce fire-related injuries and fatalities.

Budget Item No.: 6a(2) R,E&D Plan: 11.3
Program Title: Propulsion and Fuel Systems
Amount: $2,386,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	2,082	2,265	2,386	12,229

Basis for Request:

Establish airworthiness criteria and related technical materials to ensure the safety, reliability, and durability of powerplants on commercial and general aviation aircraft. Review changes in the specifications and availability of aviation fuels and conduct research and development necessary to maintain and enhance propulsion and fuel system safety.

Description of Solution:

This program involves the development of criteria, guidelines, and data to support improvements in the certification requirements for turbine and piston engines. In particular, in-service propulsion system failures will be analyzed and research and development efforts will be initiated as required; the bases for revised engine water and bird ingestion criteria will be developed; techniques for the prediction and prevention of uncontained turbine engine failures will be examined; light-weight materials will be developed for containing engine rotor failures; current powerplant fire protection guidelines will be evaluated, along with techniques for detecting flammable fluid leaks; the thermal and mechanical durability of advanced propulsion systems will be assessed; approaches to improved post-crash fuel safety will be evaluated; and the impact of changing and alternate aviation fuels and the high-speed transport elevated fuel temperatures on aircraft safety and certification requirements will be examined.

Program Request:

Ingestion

The collection of data on damage to turbine engines caused by ingestions of different types, sizes, and numbers of birds is continuing. In FY 1989, the bird ingestion program was expanded to include advanced engine models installed on existing wide-bodied aircraft. A study of analytical techniques to define blade resistance criteria for such soft-body impacts was initiated in FY 1990. In FY 1991, the results of earlier work will be applied to an analysis of the effects of bird ingestion on advanced engines, such as the unducted and super high bypass ratio fan engines, and the criteria for assessing the thrust loss as a result of bird damage to inlet fans will be developed. Analysis of in-service data in FY 1988 revealed that operational problems were being encountered during flight in heavy rainfall. An analytical study of the engine compressor water ingestion process developed in earlier years was revised and improved upon in FY 1988 and FY 1989. In FY 1990 and FY 1991, the analysis will be extended to the combustor section and to include transient conditions during step changes in water ingestion and changes in power setting, altitude and speed.

Rotor Burst Protection

The work initiated in FY 1988 on the development of light-weight containment materials and the analysis of current instances of non-containment turbine engine rotor failures continued in FY 1990 and will continue in FY 1991. The collection and analysis of turbine engine data to identify critical parameters related to incipient rotor failure continued through FY 1990. In FY 1991, analytical procedures will be employed to develop techniques and/or sensors that can predict an incipient non-containment failure.

Durability

Propulsion technology is increasing the engine efficiencies of future engines, and as such, the use of superalloys, ceramics, and coatings will permit the engines of the 1990's to operate at much higher temperatures and pressures. The durability of future engines is a concern, with thermal and mechanical fatigue/ fracture problems likely to become more serious. Analysis was initiated in FY 1990 and will continue into FY 1991, to determine if current standards adequately address engine durability problems under the more extreme operating conditions.

Fuel investigations

Evaluations of promising approaches to improve post-crash fuel safety were initiated in FY 1989 and continued in FY 1990 and will continue in FY 1991. Among these approaches are industry developed fuels to control post-crash fire, techniques to reduce spillage and suppress ignition sources, and the suppression of the fuel vaporization after spillage. With advancing technology in engine performance through higher operating temperatures, the threat of fuel fires in the event of inadvertent leakage is exacerbated. An investigation was initiated in FY 1990 to determine the feasibility of sensing the presence of flammable mixtures in powerplant installations. A study of the effect of the elevated fuel temperatures, associated with the high-speed transport, on aviation safety and certification requirements will be initiated in FY 1991. An investigation into certification problems associated with the use of alcohol-modified kerosene fuels for turbine engines in general aviation was completed in FY 1990.

Benefits:

Solutions to improve propulsion system safety and reliability will provide a framework for future technology standards to support aircraft engine certification. Improved guidance material will be made available to deal with in-service problems of ingestion, engine case containment, post-crash fire, fuel safety and operation safety.

Budget Item No: 6a(3) R,E&D Plan: 11.2
Program Title: Structural Crashworthiness/Airworthiness
Amount: $3,756,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	2,432	5,684	3,756	20,558

Basis for Request:

Establish an appropriate technical data base for preparing crashworthiness and structural airworthiness criteria for both fixed-wing and rotary-wing aircraft. Conduct research and development to: (1) develop test procedures for demonstrating compliance with such criteria; and (2) generate the technical data needed to support the development of certification standards, performance criteria, advisory circulars and other regulatory material necessary to maintain and enhance aircraft and occupant safety.

Description of Solution:

To accomplish this program, experimental and analytical research efforts addressing structural airworthiness and crashworthiness safety issues will be developed and performed to generate a data base to support the development of standards, guidelines, and performance criteria related to (1) ensuring the continued structural airworthiness of aircraft to minimize/preclude the occurrence of an aircraft accident; and (2) given such an event may occur, to reduce/prevent occupant injuries and fatalities due to the crash impact environment. The impact characteristics and crash resistance of metal and composite structures will continue to be investigated as the primary approach to understanding the interactions of the following under dynamic crash loads: the fuselage; the floor and seat structures, including occupant restraint systems; the cabin interior furnishings; and structural fuel containment. Analytical modeling techniques will be employed to evaluate the impact characteristics of various sizes of commuter-type aircraft, as well as occupant emergency evacuation performance. Various composite structural configurations will be evaluated for both impact resistance and foreign-object damage tolerance. Advanced materials characteristics, damage containment techniques, and failure analysis techniques will be investigated, as well as the effects of fatigue and the environment on advanced composite airframes. Engineering and inspection handbooks will be developed/revised as necessary, based on technology growth. Research efforts will continue to determine the effectiveness of advanced nondestructive inspection (NDI) concepts on composite airframe structures.

Program Request:

Aircraft Crashworthiness and Occupant Protection

During FY 1990 and FY 1991, the crashworthiness program will focus on design improvements to both commuter/small transport and wide-body airplanes. Commuter airplane dynamic tests, initiated in FY 1989, will continue in FY 1991. These tests on metallic aircraft structures will provide baseline data for subsequent composite airplane structures testing. Work was initiated in FY 1990 and will continue throughout FY 1991 to investigate interior cabin furnishings in commercial airplanes. In addition, an effort began in FY 1990 to access the crashworthiness characteristics of new concept seating arrangements in wide-body airplanes. These efforts will provide data to support existing regulations, support a change to existing regulations or support initiation of new regulatory requirements.

Analytical Modeling

Results of work initiated in FY 1989 to develop a structural response envelope for various commuter airplane configurations continued through FY 1990. In FY 1991, this effort will be expanded to include water impact analysis development. This effort will provide a method to assess impact data for all commuter aircraft designs and configurations. Efforts to update the documentation of Program KRASH continued in FY 1990. Work to expand Program KRASH's capability to analyze composite structures has been slowed due to limited test data. It is anticipated that the program will be continued into FY 1991 as more full-scale test data becomes available. In FY 1990, efforts were initiated to validate the modeling of commuter seat/restraint systems using a seat modeling program. It is anticipated this work will continue into FY 1991.

Crash Resistant Fuel Systems

In FY 1989, a series of longitudinal and vertical tests were initiated to evaluate the crashworthiness of transport airplane auxiliary fuselage fuel tank systems. This work, which includes the testing of three different fuel tank configurations, continued throughout FY 1990 and into FY 1991. It is anticipated that tests will be initiated in FY 1991 to address centerline and wing, root fuel tanks. Efforts continued throughout FY 1990 and will continue in FY 1991 to identify and evaluate advanced construction and installation methods for rupture resistant fuel cells and frangible line and fitting installation for both general aviation airplanes and rotorcraft. Data will be used to support the development of regulatory criteria for crash resistant fuel systems.

Aircraft Water Crash Landings
This effort was initiated in FY 1990 and focused on an analysis of worldwide water impact accident data to determine the structure response and flotation performance of both commuter category airplanes and rotorcraft. It is anticipated that both of these efforts will continue into FY 1991. Analytical procedures will be employed to help analyze the collected data. This effort will provide data to support the development of ditching criteria.

Composite Airframe Impact Dynamics
Although initiated in FY 1989, this in-house test effort progressed slowly in FY 1990 due to the paucity of full-scale composite airplane crash test data. In FY 1990, composite airplane structures were procured, analyzed and tested. This testing will continue into FY 1991. It is anticipated that this program will be a joint FAA/NASA/DOD program.

Composite Failure Analysis Handbook
This work, initiated in FY 1988, is a joint FAA/USAF multi-year effort whose objective is to provide inspectors and investigators with guidelines for the analysis of accidents/incidents involving fiber reinforced composite structures. In FY 1990, program efforts were directed towards the development of fractographic techniques and methods required for failure sequence identification in failed composite segments. Work in FY 1991 will address the verification of the failure analysis system and the documentation of field results.

Upgrading FAA Advanced Composite Manufacturing Inspection Handbook and Fiber Analysis Test Book
An effort was initiated in FY 1990 to update various chapters in the certification engineer's fiber analysis and design book. This work will continue into FY 1991. Also, in FY 1990 an effort was initiated to revise the manufacturing and airworthiness inspectors handbook. This work also will be ongoing throughout FY 1991.

Advanced Materials - Material Property Test Methods
This joint FAA/US Army multi-year effort's technical objective (which is the standardization of testing methods to determine composite materials properties) and schedule was finalized in FY 1989. In FY 1990, work was initiated under this agreement and addresses tension test methods. This effort will be expanded in FY 1991 to include compression test methods.

Nondestructive Inspection (NDI) - Advanced Materials
Although this contractual effort was initiated in FY 1988, actual test work began in FY 1989. In FY 1990, this effort addressed an evaluation of the ability of various NDI methods to detect reduced strength bonds. In FY 1991, this work will be expanded to include the development of specification techniques and NDI procedures for generating, detecting and quantifying flawed structures due to reduced strength/weak bonds. This data will be used to update the advisory circular on composite aircraft structure.

Advanced Materials - Fatigue/Damage Tolerance/Load Spectrum Effects
This work was initiated in FY 1989 and in FY 1990 addressed the effects of cyclic loading (acceleration testing) truncation on the ability to predict material degradation rates and modes. In FY 1991, factors such as moisture/temperature cycles, delamination and fiber pullout/breaks will be included in the analysis. The results will be used to revise the advisory circular on composite structures.

Composite Structures-Foreign Object Damage/Impact Sensitivity
In FY 1989, this multi-year joint FAA/US NAVY activity was expanded to address foreign object damage (FOD). In FY 1990, the work included FOD on cylindrical laminates which could result in explosive decompression. Methodologies will be developed in FY 1991 to account for the scale up effects demonstrated in the experimental work. This effort is a multi-phased effort with each effort developing data to support criteria on residual strength.

Benefits:
Efforts are directed towards the development of data packages and the identification of research to provide the traveling public with the highest degree of safety consistent with the state-of-the-art. Results will provide support for existing regulations, support a change to existing regulations, or support initiation of new regulatory requirements in the area of crashworthiness and structural airworthiness.

Budget Item No.: 6a(4) R,E&D Plan: 11.8
Program Title: Aging Aircraft
Amount: $5,749,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	3,858	4,060	5,749	26,570

Basis for Request:
Establish an appropriate data base for evaluating the safety and reducing the risks associated with the design, maintenance and operation of new and in-service aircraft airframe and engine structures. Develop technology to predict, detect, and prevent structural fatigue, corrosion, and multi-site cracking within these structures, considering short, intermediate, and long- term objectives.

Description of Solution:
Generate technical data needed to support the development of advisory and/or regulating criteria and improvements in performance and safety as associated with structural fatigue, corrosion, and related nondestructive evaluation. Initiate short, intermediate, and long-term studies to ensure the continued performance and safety of airframe and engine structures on current, new, and future generation aircraft. Transfer technology from government and civilian institutions which are recognized and have substantial applied experience in the technical areas involving fatigue, corrosion and non-destructive evaluation. Assess failure mechanisms, methodologies and tests used to substantiate the safe life, fail safe, and damage tolerant designs (and repairs) and determine needs relative to structural surveillance and life management procedures. Review and evaluate current, new, and advanced maintenance, inspection and repair practices to include the development of in-depth data bases and the updating of nondestructive inspection systems/procedures applicable to fatigue cracking and corrosion detection.

Program Request:
In addition to the program described below, the human factors portion of the Aging Aircraft Program is included under Aviation Medicine Program 5a(5).

Program Integration
In FY 1989, a National Aging Aircraft Research Program Plan was completed followed by an International Aging Aircraft Conference held in early FY 1990. Results of this conference focused upon the status of the overall aging aircraft program including the updating of the Research Program Plan and the initiation of follow-up workshops and conferences within the FY 1990 and FY 1991 timeframe.

Technology Transfer
In FY 1989, research actions which involve the transfer of fatigue, corrosion, and nondestructive inspection data from civilian and government organization were initiated. Reports covering a review of this data, to include the identification of systems and procedures and considering their application to civil aircraft will be completed within the FY 1990 and FY 1991 timeframe.

Structural Integrity
In FY 1989, and as part of a fatigue tracking and flight loads data collection program, a report on flight loads data collected from existing narrow and wide-body airplanes was completed. A new upgraded on-board data collection system was developed for application to new airplanes in FY 1990 and will be installed for implementation and evaluation in FY 1991. The initiation of work in FY 1989 that related to the definition and analysis of failure mechanisms, to include fatigue cracking, disbonds and corrosion effects, was continued with the completion of a handbook on damage tolerance in FY 1990. Efforts that included the initiation of studies in FY 1989 on (1) the feasibility of airframe proof pressure testing, (2) a structural safety risk analysis, (3) a fatigue analysis/test methodology assessment and, (4) a review of engine case and static component conditioning effects, will be completed within the FY 1990 and FY 1991 timeframe.

Maintenance Inspection and Repair
As initiated in FY 1989, and from information obtained under the Technology Transfer activity, an in-depth evaluation of both airframe and engine nondestructive evaluation (NDE)/nondestructive inspection (NDI) systems and techniques will continue in FY 1990 and FY 1991 timeframe. Resulting from this effort, an engine structure NDE effectivity report was completed in early FY 1990. In addition, a handbook covering a NDI equipment evaluation will be completed in FY 1991. With respect to investigation into other maintenance and repair activities, the initiation of a maintenance data base review effort in FY 1989 continued in FY 1990 and will continue through FY 1991. This effort will include a review of available operator and manufacturer corrosion-related findings and an assessment of airframe and engine repair practices. Results will be published under a series of technical reports within the FY 1990 and FY 1991 timeframe. New programs in FY 1991 will include the initiation of engine fatigue/thermal and life cycle analyses and the initiation of a structural repair technology review. In FY 1991, research covering NDI advanced systems development will be initiated.

Benefits:
The aging aircraft research program will enhance aircraft and passenger safety through better understanding of the aircraft's structural performance to include such items as causes of in-service structural fatigue mechanisms (fatigue, crack growth), corrosion, methods of detection, and corrective maintenance which will ensure continued airworthiness.

Budget Item No: 6a(5) RE&D Plan: 11.4
Program Title: Flight Safety/Atmospheric Hazards
Amount: $3,888,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	2,226	2,500	3,888	15,446

Basis for Request:
Obtain and provide the technical data necessary to develop certification standards and flight procedures for icing conditions for all categories of aircraft. Develop a data base to support the standards for certifying aircraft subjected to an electromagnetic environment, both lightning and high energy RF fields. Provide the technical data for guidance on advanced flight critical software-based flight control and avionic system concepts. Develop and provide flying qualities and operational guidance material needed by the agency standards, flight test and certification personnel in their flight safety compliance assessment of new aircraft control systems, displays, and flight test/operational procedures.

Description of Solution:
The aircraft flight safety, atmospheric, and man-made hazard efforts address new technologies, designs, and operational issue activities that will provide technical data, guidelines, advisory material, and procedures in support of the regulatory and certification process. These flight safety projects include aircraft icing, electromagnetic environments, advanced digital flight control systems, and flying qualities and operations.

Program Request:
In FY 1990, efforts continued related to measurements of hold over time following deicing. In conjunction with NASA, aerodynamic effects of advanced deicing fluids on the performance of small aircraft will be investigated. In FY 1991, the worldwide atmospheric environment icing data collection effort will continue. Continuing efforts will include assessment of icing severity terminology, updating of the Aircraft Icing Handbook, and the effort with NASA for the validation of analytical technologies, computer codes and simulation methodologies. Ground deicing efforts will include an assessment of hold over time methodologies, fluid studies and an update of advisory material. During FY 1990, efforts continued on analysis of worldwide data and developing simulation/testing procedures for indirect and direct lightning hazards. During FY 1991, the focus of the lightning project will be to verify and refine the models used in the testing/certification process. During FY 1990, the advisory circular and users manual addressing the Hazards of High Energy RF(HERF) were published and additional testing and analysis of the potential threats were accomplished. Efforts will be to develop an international threat envelope, develop the test and simulation techniques to determine the safety margins associated with digital, flight critical, flight control and avionics. In FY 1990, topics such as software quality metrics and bus architecture integration were added to the Digital Systems Validation handbook. Similarly, the handbook will be updated in FY 1991 to include topics such as expert systems, pilot/vehicle interface, and voice command and control. As apart of

the research with NASA which began in FY 1989, efforts were initiated in software assessment, electro-optical characteristics and error correcting digital systems. These efforts will continue in FY 1991. In FY 1989, a Memorandum of Agreement (MOA) went into effect with the National Research Council-Canada to facilitate flight-test/flying qualities research. The emphasis of this work for FY 1990 was placed on flight-test programs related to the certification guidance materials for rotorcraft. The variable stability Bell Helicopter will be used to obtain guidance material as related to advanced flight controllers, control systems, displays and operational and guidance procedures. Deliverables will include data reports and workshops.

Benefits:
The program will provide state-of-the-art information, technical data, guidelines, advisory material, procedures, methodologies, etc., to address new aircraft/systems technologies, designs, and operational flight safety in support of the regulatory and certification processes.

Budget Item No.: 6a(6) R,E&D Plan: 13.1
Program Title: Explosives Detection
Amount: $22,615,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	8,609	13,370	22,615	39,354

Basis for Request:
Develop improved systems and devices for detecting explosives in checked and carry-on baggage, in air cargo, and on passengers. The systems are to be fully automated and require no operator interpretation, screen rapidly and efficiently commensurate with the normal flow of passengers and baggage, and have high detection and low false alarm probabilities in operational screening.

Description of Solution:
The FAA is working on the development of two basic types of explosives detectors: one designed to collect, analyze, and identify vapors from different explosives and the other designed to use electromagnetic energy or nuclear radiation to penetrate and identify bulk explosives based on their elemental or structural composition. Since they are passive devices, vapor detectors are the only known approach for screening passengers. However, both vapor and bulk explosive detectors may be applicable to screening a wide variety of objects. The overall project has both near-term and long-term components. In the near-term, both vapor and bulk prototype detectors have been and continue to be developed so as to provide immediate capabilities to respond to a terrorist threat. In the long-term, the emphasis has been on identification, feasibility demonstration, and subsequent development of the most promising new technologies for future availability.

Program Request:
In FY 1989, the FAA made the decision to deploy six dual sensor systems for the screening of checked baggage at selected United States and foreign airports. The dual sensor system combines thermal neutron analysis and commercially available X-ray units together with an expert systems approach to identification of concealed explosives. The first system was delivered to JFK International Airport in the summer of 1989 and five additional systems were deployed within seven months. The vapor portal for screening people was tested at Boston Logan Airport in October 1988, and after further developmental efforts to improve its screening speed and sensitivity, was retested at an airport in late summer of 1990. In FY 1991, the FAA will procure explosive detection systems to be deployed at various international gateway airports in the United States and abroad, which may be potential targets for criminal acts upon civil aviation. These systems can also be employed on an as-needed basis to other locations as may be dictated by evolving intelligence threat information. This is part of an extensive prototype testing program for vapor detection systems to screen passengers before aircraft boarding. Incidents resulting from explosive devices will be thwarted by the explosive detection systems and will be deterred by the presence of the systems. This will further enhance the security posture at airports saving both lives and property. In prior years, vapor detection approaches for automated screening of baggage have been investigated. In FY 1989, testing revealed that current vapor detectors have insufficient sensitivity for plastic explosives concealed in baggage. Pending the demonstration of enhanced sensitivity, the development of a vapor baggage screening system will be delayed. In FY 1989, for the fourth consecutive year, there were solicitations for new concepts in explosive detection, a substantial number of proposals in both bulk and vapor detections were submitted and evaluated. There will be even greater emphasis placed on appealing to industry and academia for innovative

approaches in FY 1990 and FY 1991, with solicitations for bulk and vapor proposals each year. In FY 1989, feasibility studies on a number of approaches were completed and two of the approaches were shown to be extremely promising as next generation detection schemes. In FY 1990, a vapor detector breadboard based on biotechnology was completed and field testing began. In FY 1991, the biotechnology prototype will be completed and operationally tested. In FY 1990, efforts continued to design and develop components for a classified nuclear technique for screening checked baggage and cargo. A breadboard system based on this technology will begin development in FY 1991. In FY 1991, an Explosives Detection Laboratory will be established to (1) test and evaluate prototype and commercial detection systems and devices, (2) conduct experiments on breadboard equipment to determine feasibility of new technology approaches proposed to FAA and other government agencies for detection of explosives and (3) set up a demonstration site within the Laboratory where FAA and other governmental security specialists would gain first-hand experience with current security systems and devices in place at U.S. and foreign airports.

Benefits:
The Explosives Detection Laboratory will be more efficient and cost effective in terms of internal test and evaluation versus contractor support, and will allow much faster turn-around of evaluation of prototype and commercial systems. This Laboratory will also provide a unique capability for use by all governmental agencies engaged in anti-terrorist activities. New explosive detection systems will become available to screen baggage, cargo, and passengers efficiently and effectively. Such systems will provide protection for U.S. carriers and civil aviation, in general, against terrorist bombings of aircraft and airport facilities.

Budget Item No.: 6a(7) R,E&D Plan: 13.2
Program Title: Weapons Detection
Amount: $1,899,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	0	0	1,899	7,902

Basis for Request:
Enhance current concourse security systems used to detect weapons on people and in carry-on baggage. Develop screening systems based on alternate technologies, which are capable of detecting "plastic" and other non-conventional weapons.

Description of Solution:
There has been a trend in the manufacture of firearms toward fabrication with a greater number of non-metallic components and with more durable, but often difficult to detect alloys. Accordingly, commercial detection devices are being evaluated and new standards developed to assure the continuing effectiveness. Methods of enhancing the performance of the current generation of screening systems are being investigated. Alternate methods to detect non-metallic handguns and ordnance, as well as flammable liquids are being investigated. The development of a passenger screening system based on one alternate technology has been initiated.

Program Request:
In FY 1990, the evaluation of commercial X-ray screening systems was completed. Detection software for X-ray system identification of handguns was completed and a breadboard device to screen bottles in carry-on for flammables and liquid explosives was tested. A breadboard screening system based on millimeter wave technology was completed and testing initiated. In FY 1991, the emphasis will be on an accelerated development of a prototype millimeter wave screening system for people. The completion of the development test and evaluation of the prototype and the availability of an operationally viable system is planned in FY 1992. In FY 1991, the prototype bottle screener will be developed and tested.

Benefits:
New and enhanced concourse security systems will become available for efficiently and effectively screening passengers and their carry-on baggage for weapons. Such systems will provide protection for civil aviation against hijacking by criminals and terrorists.

Budget Item No.: 6a(8) R,E&D Plan: 13.3
Program Title: Airport Security
Amount: $1,249,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	0	0	1,249	5,188

Basis for Request:
Establish an integrated airport security plan for a higher level threat. Determine effectiveness, impact, and cost of enhanced airport security.

Description of Solution:
The current and future terrorist threats to airport security and operations have been initially defined, and prioritization in protection of aviation targets and in countering the various types of threat made. The desired goals have been correlated with existing FAA regulations and actual airport security plans, which generally assume a lower level of threat. An enhanced system conceptual design has been developed for security approaches and operational procedures to effectively counter a higher level of threat, such as an insider, while maintaining economic viability, responsiveness, and maintenance of passenger flow. Finally the security design will be implemented and operationally tested at a major airport.

Program Request:
In prior years studies have been performed on threat definitions, generalized United States airport vulnerabilities, and prioritization of protection goals. In FY 1989, a conceptual design was completed for the upgrading of the airport security of two terminals of Baltimore-Washington International Airport. The design represents the coordinated efforts of the airport operator, the air carriers directly involved at the terminals, and the FAA. In FY 1990, the conceptual design was implemented and there will be a full-scale demonstration through FY 1991 of security systems and procedures to evaluate the effectiveness of various security strategies and their impact on airport operations. In FY 1989, an access control study for generic airports was completed in support of FAA rulemaking. In FY 1990, the access control area was included as a pilot project in the full-scale demonstration. In FY 1991, additional developmental work on access control is planned.

Benefits:
Analyses on design and implementation options for more effective and cost-beneficial, overall security systems will become available for air carriers and airport operators. The integrated security approach will lead to greater flexibility and a capability of the airport system to respond to a higher level terrorist threat.

Budget Item No.: 6a(9) R,E&D Plan: 13.4
Program Title: Security Systems Integration
Amount: $599,000

Appropriation Summary: (Amount: $000)	FY 1989	FY 1990	FY 1991	FY 1992-1995
	0	0	599	2,651

Basis for Request:
Procedures and hardware are developed for identifying and countering threats to aircraft and airport facilities. Damage assessment studies for explosive detonation on board aircraft are conducted. Methods of detecting bomb components are investigated as well.

Description of Solution:
This project area consists of a broad range of activities: (1) The development of an additive for electric blasting caps which would make them readily detectable. (2) The development of special purpose communication equipment for use on aircraft by air marshals. (3) Explosives testing on aircraft to assess damage for various scenarios, as well as to identify "least risk" locations whereby explosive damage to an aircraft in flight is minimized. and (4) The identification of methods to protect an aircraft against catastrophic structural failure due to an in flight explosion.

Program Request:
In FY 1990, an assessment of additive detector hardware was completed and results of the manufacturers' studies became available. In FY 1989, special communication equipment for air marshals was completed and evaluation began. The effort was completed in FY 1990. In FY 1989, explosive tests on aircraft and baggage containers were conducted to simulate actual terrorist attacks worldwide. Such testing and the

related identification of "least risk" locations will continue indefinitely. Finally, in response to a terrorist attack an effort was initiated in FY 1989 to investigate hardening aircraft baggage holds against explosions. The initial study focuses on theoretical methods of blast suppression. In FY 1990 and FY 1991, the study will be extended to actual explosive tests on fuselages.

Benefits:
Hardware and procedures will become available to airport, air carrier, and FAA personnel for the identification and neutralization of threats to aircraft and airport facilities. They will substantially improve the current capabilities.

RESEARCH, ENGINEERING, AND DEVELOPMENT
(AIRPORT AND AIRWAY TRUST FUND)
Fiscal Year 1991

BUDGET ACTIVITY 7: ENVIRONMENT; SUBACTIVITY 7a: ENVIRONMENT

Budget Item No.: 7a(1) R,E&D Plan: 10.8(a)
Program Title: Aircraft Engine Emissions Reduction and Control
Amount: $350,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	354	370	350	1,400

Basis for Request:
Minimize air pollution impacts from aircraft both around the nation's airports and in the upper atmosphere. Develop accurate means for assessing the environmental impacts of aircraft operations and reduce these impacts through improved technology.

Description of Solution:
Develop models to assist in prediction of aircraft emissions impacts on air quality around airports and in the upper atmosphere. Jointly with the Environmental Protection Agency and the U.S. Air Force, measure and validate computer programs used in the assessment of aircraft emissions impacts. Improve the technology for predicting and abating such impacts through joint programs with industry and set improved regulatory standards for emissions. Maintain current inventory of engine emissions characteristics by development of data for new technology engines and expansion of data base for newly certificated engines.

Program Request:
In FY 1990, a new FAR Part 34 was issued to replace and improve on the requirements in SFAR 27. This FAR will be updated to be consistent with known changes in the Clean Air Act. Revision of methods for computing the aircraft contribution to pollution in the upper atmosphere was begun by re-examining mathematical models. In FY 1991, these models will be maintained to reflect the current knowledge of aircraft engine emissions. Analysis of technology options for improving aircraft engine emissions certification standards was begun in FY 1990. This work will continue in FY 1991 with emphasis on new technology engines. There will also be continuing supporting analyses for air quality standards under development within the International Civil Aviation Organization. Continue support of government/industry programs for predicting and abating impacts and for improving regulatory standards for emissions. Maintain engine emissions data base for both new and existing engines.

Benefits:
Reduction in aircraft air quality impacts around airports and in the upper atmosphere. Improved understanding of aviation contribution to global warming.

Budget Item No.: 7a(2) R,E&D Plan: 10.8(b)
Program Title: Aircraft Noise Reduction and Control
Amount: $2,050,000

Appropriation Summary:	FY 1989	FY 1990	FY 1991	FY 1992-1995
(Amount: $000)	1,189	1,600	2,050	8,600

Basis for Request:
Minimize noise constraints on the growth of aviation, especially airport capacity, through the development of the technology and expertise to mitigate or control the environmental impacts of such growth. Develop accurate means for assessing the environmental impacts of aircraft operations and reduce those impacts through improved technology.

Description of Solution:
Develop improved computer models of aircraft/airport operations, including detailed power management accountability for tomorrow's aircraft and the effects of new air traffic control equipment and procedures. Add the effects of new aircraft categories, i.e., high speed civil transport, tilt-rotor, and advanced turboprop, to existing models used in airport planning/noise prediction. Enhance computer modelling of helicopter noise prediction and analyze both design and operational options for noise abatement. Develop technology/economic trade-offs for increasing noise regulation stringency alternatives.

Program Request:
In FY 1990, revised standard methods for computing atmospheric attenuation were added to the FAA's Integrated Noise Model. In FY 1991, these models will be maintained. Analysis of technology options for increasing stringency of airplane noise certification standards was begun in FY 1990. A limited amount of this work will continue in FY 1991 with emphasis on helicopters and re-engine older turbofan airplanes. There will also be continuing supporting analyses for international noise standards under development within the International Civil Aviation Organization. Noise standards will be drafted for high speed civil transport (advanced SST) aircraft based on reported technological developments and economic analyses. Among the issues to be addressed is mitigation of sonic booms.

Benefits:
Reduction in aircraft noise impacts and the concurrent reduction in constraints on the orderly development of American civil aviation. This work also will assist in keeping U.S. exports at a high level.

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
TRUST FUND SHARE OF FAA OPERATIONS
Program and Financing (in thousands of dollars)

Identification code 69-8104-0-7-402	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
10.00 Total obligations.(O.C. 25)...	476,920	807,181	2,846,000
Financing:			
22.40 Unobligated balance transferred, net...........	-5,600	....	....
39.00 Budget authority.........	471,320	807,181	2,846,000
Budget authority:			
Current:			
40.00 Appropriation................	471,320	816,500	2,846,000
40.00 Reduction pursuant to P.L. 101-164................	....	-2,450	....
40.00 Reduction pursuant to P.L. 99-177.................	....	-6,869	....
43.00 Appropriation (adjusted)......	471,320	807,181	2,846,000
Relation of obligations to outlays:			
71.00 Obligations incurred, net.....	476,920	807,181	2,846,000
72.40 Obligated balance, start of year.........................	537	4	....
74.40 Obligated balance, end of year........................	-4	....	....
90.00 Outlays.....................	477,454	807,185	2,846,000
(Mono cast: 21.5)	(Mono cast: 8)	(Mono cast: 8)	(Mono cast: 4.8)

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
TRUST FUND SHARE OF FAA OPERATIONS

The Airport and Airway Improvement Act of 1982, as amended by the Airport and Airway Safety and Capacity Expansion Act of 1987, authorizes use of the Airport and Airway Trust Fund as the source of financing a portion of FAA's operating costs. Cost allocation studies by the FAA show that, overall, 85 percent of the cost of the FAA's programs is attributable to the users contributing to the trust fund. For 1991, it is proposed that $2,846,000,000 of the Operations appropriations be financed from the trust fund to provide an overall 85 percent cost recovery. This means that the trust fund will help pay for the salaries and related expenses of FAA's critical safety employees who have the daily responsibility of ensuring the safety of the flying public.

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
TRUST FUND SHARE OF FAA OPERATIONS
Object Classification (in thousands of dollars)

Identification code 69-8104-0-7-402	19 89 actual	1990 estimate	1991 estimate
25.0 Other services...............	476,920	807,181	2,846,000
99.9 Total obligations...........	476,920	807,181	2,846,000
(Memo cmt: 31.8)	(Memo cmt: 8)	(Memo cmt: 8)	(Memo cmt: 4.8)

DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

General Provisions

Sec. 301. During the current fiscal year applicable appropriations to the Department of Transportation shall be available for maintenance and operation of aircraft; hire of passenger motor vehicles and aircraft; purchase of liability insurance for motor vehicles operating in foreign countries on official department business; and uniforms, or allowances therefor, as authorized by law (5 U.S.C. 5901-5902).

Sec. 303. Funds appropriated under this Act for expenditures by the Federal Aviation Administration shall be available (1) except as otherwise authorized by the Act of September 30, 1950 (20 U.S.C. 236-244), For expenses of primary and secondary schooling for dependents of Federal Aviation Administration personnel stationed outside the continental United States at costs for any given area not in excess of those of the Department of Defense for the same area, when it is determined by the Secretary that the schools, if any, available in the locality are unable to provide adequately for the education of such dependents, and (2) for transportation of said dependents between schools serving the area that they attend and their places of residence when the Secretary, under such regulations as may be prescribed, determines that such schools are not accessible by public means of transportation on a regular basis.

Sec. 307. None of the funds appropriated in this Act shall remain available for obligation beyond the current fiscal year nor may any be transferred to other appropriations unless expressly so provided herein.

Sec. 309. The expenditure of any appropriation under this Act for any consulting service through procurement contract pursuant to section 3109 of title 5, United States Code, shall be limited to those contracts where such expenditures are a matter of public record and available for public inspection, except where otherwise provided under existing law, or under existing executive order issued pursuant to existing law.

[Sec. 324. Requires the Federal Aviation Administration to satisfy specific work force staffing requirements for air traffic controllers.]

Sec. [325 (a)] 316. ESSENTIAL AIR SERVICE COMPENSATION.--Notwithstanding any other provision of law, the Secretary of Transportation shall make payment of compensation under subsection 419 of the Federal Aviation Act of 1958, as amended, only to the extent and in the manner provided in appropriations Acts, at times and in a manner determined by the Secretary to be appropriate, and claims for such compensation shall not arise except in accordance with this provision.

[Sec. 328. Requires absorption of funds necessary for fiscal year 1990 pay raises.]

[Sec. 330. Prohibits use of funds on regulations that would establish a vessel traffic safety fairway in California; authorizes the FAA Administrator to grant releases from elements in the deed of conveyance for property in Hawaii.]

[Sec. 331. Allows airports to transfer certain instrument landing systems and related equipment to the Federal Aviation Administration.]

[Sec. 335. Amends the Federal Aviation Act of 1958 to provide a permanent prohibition against smoking on scheduled airline flights.]

[Sec. 346. Allows use of Federal airport funds to soundproof private schools in a noise impact area surrounding an airport.]

GLOSSARY OF ABBREVIATIONS APPEARING IN FAA JUSTIFICATION

AAS	Advanced Automation System
AAS	Automated Airport Service
ACARS	Air Carrier Address and Reporting System
ACCC	Area Control Computer Complex
ACD	Automatic Call Distributor
ACF	Area Control Facility
ACT	Federal Aviation Administration Technical Center
ADAP	Airport Development Aid Program
ADAS	AWOS Data Acquisition System
ADCN	Agencywide Administrative Data Communications Network
ADDM	Automated Documentation Development and Maintenance
ADI	Attitude Direction Indicator
ADP	Automated Data Processing
ADS	Automatic Dependent Surveillance
ADTN	Administrative Data Telecommunications Network
AERA	Automated En Route Air Traffic Control
AF	Airway Facilities
AFIS	Automated Flight Inspections System
AFSS	Automated Flight Service Station
AIMP	Aeronautical Information Management Program
AIP	Airport Improvement Program
ALS	Approach Light System
ALSIM	Airport Landside Simulation Model
ALSIP	Approach Lighting System Improvement Program
AMMP	Agency Management Modernization Plan
AMS	Aeronautical Mobil Service
ARF	Aviation Route Forecast
ARINC	Aeronautical Radio, Incorporated
ARRAS	Aircraft Registration Records Administration System
ARSR	Air Route Surveillance Radar
ARTCC	Air Route Traffic Control Center
ARTS	Automatic Radar Terminal System
ASAS	Aviation Safety Analysis System
ASDE	Airport Surface Detection Equipment
ASDO	Aviation Standards District Office
ASOS	Automated Surface Observing System
ASTA	Airport Surface Traffic Automation
ASR	Airport Surveillance Radar
ASRP	Aviation Safety Reporting Program
ATAS	Automated Traffic Advisory Service
ATC	Air Traffic Control
ATCAC	Air Traffic Control Advisory Committee
ATCCC	Air Traffic Control Command Center
ATCRBS	Air Traffic Control Radar Beacon System
ATCT	Airport Traffic Control Tower
ATIS	Automated Terminal Information System
ATMS	Advanced Traffic Management System
AT&T	American Telephone and Telegraph
AUTODIN	Automatic Digital Network
AVS	Office of Aviation Standards

AWIPS	Advanced Weather Information Processing Systems
AWIS	Airport Weather Information System
AWOS	Automated Weather Observing System
BANS	Bright Radar Indicator Tower Equipment (BRITE) Alpha-Numeric Subsystem
BIS	Budget Information System
BPS	Bits Per Second
BRITE	Bright Radar Indicator Tower Equipment
BUEC	Backup Emergency Communications
CAAA	Clean Air Act Amendment
CADM	Computer-Aided Decisionmaking
CAIS	Comprehensive Airmen Information System
CAMI	Civil Aeromedical Institute
CARF	Central Altitude Reservation Function
CAT	Category
CBR	Commercially Based Rent
CBI	Computer Based Instruction
CCD	Configuration Control Decision
CCMS	Central Control Monitoring System
CCS	Controller Chart Supplement
CD	Common Digitizer
CDR	Critical Design Review
CDTI	Cockpit Display of Traffic Information
CERAP	Combined Center Radar Approach Control
CERAP	Consolite San Juan Facilities Center Radar Approach
CFCF	Central Flow Control Function
CFR	Crash-Fire Rescue
CONUS	Continental, Contiguous, or Conterminous United States
COS	Change of Station
COTS	Commercial off-the-shelf
CPG	Central Programming Group
CPMIS	Consolidated Personnel Management Information System
CT	Centralized Training
CUP	Central Utilities Plant
CWF	Controller Work Force
CWP	Central Weather Processor
CWSU	Central Weather Service Unit
DAR	Designated Airworthiness Representative
DARC	Direct Access Radar Channel
DASD	Digital Access Storage Devices
DASI	Digital Altimeter Setting Devices
DBRITE	Digital Bright Radar Indicator Tower EQuipment
DECCO	Defense Commercial Communications Office
DEMARCS	Demarcation
DF	Direction Finder
DLP	Data Link Processor
DME	Distance Measuring Equipment
DMN	Data Multiplexing Network
DMSA	Designated Major Systems Acquisition
DOD	Department of Defense
DOL	Department of Labor

DOS	Department of State
DOT	Department of Transportation
DOTS	Dynamic Ocean Track System
DUAT	Direct User Access Terminal
DVOR	Doppler Very High Frequency Omnidirectional Range
EAP	Employee Assistance Program
EARTS	En Route Automated Radar Tracking System
ECT	Evaluation, Currency and Transportation
EFAS	En Route Flight Advisory Service
EFIS	Electronic Flight Instrumentation Systems
EFR	Electronic Flight Rules
EIP	Employee Involvement Program
EIS	Enforcement Information System
EOQ	Economic Order Quantity
EPA	Environmental Protection Agency
E&R	Exchange and Repair
FAA	Federal Aviation Administration
FAAP	Federal Aid Airport Program
FAATC	Federal Aviation Administration Technical Center
FAM	Federal Air Marshall
FAR	Federal Air Regulation
F&E	Facilities and Equipment
FCC	Federal Communications Commission
FDD	Flight Data Display
FDIO	Flight Data Input/Output
FDS	Flight Director Systems
FEDSTRIP	Federal Standards Requisition and Issue Procedures
FERS	Federal Employees' Retirement System
FIFO	Flight Inspection Field Office
FL	Flight Level
FMS	Flight Management System
FOIA	Freedom of Information Act
FPL	Full Performance Level
FPS	Military Primary Radar
FRP	Federal Radio Navigation Plan
FSAS	Flight Service Automation System
FSDPS	Flight Service Data Processing System
FSS	Flight Service Station
FSTN	Federal Secure Telephone Network
FTE	Flight Technical Error
FTE	Full-Time Equivalent
FTP	Full-Time Permanent
FTS	Federal Telecommunication System
G/A	General Aviation
GNAS	General National Airspace System
GPS	Global Positioning System
GREAT	Graduate-Level Research and Education in Aviation Technology
GSA	General Services Administration
HAT	Height Above Touchdown

HCVR	High Capacity Voice Recorders
HEMP	High Altitude Electromagnetic Pulse
HF	High Frequency
HI-EFAS	Hi Fi Altitude En Route Flight Advisory Service
HR	Human Relations
HRM	Human Resources Management
HUD	Head-Up Display
IAPA	Instrument Approach Procedures Automation
ICAO	International Civil Aviation Organization
ICSS	Integrated Communications Switching System
IFDT	Interfacility Data Transfer
IFM	Integrated Flow Management
IFR	Instrument Flight Rules
IFSS	International Flight Service Station
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
INS	Inertial Navigation Systems
IOT&E	Independent Operational Test and Evaluation
IR&D	Independent Research and Development
IRMP	Information Resources Management Plan
ISP	Interim Support Plan
ISU	Inertial Sensor Unit
ISSS	Initial Sector Suite Subsystem
ITU	International Telecommunication Union
IVRS	Interim Voice Response System
JAWS	Joint Airport Weather Studies
JSS	Joint Surveillance System
LCN	Local Communications Network
LIP	Limited Installation Program
LORAN C	Long Range Navigation System - [Pulsed, Hyperbolic) Operating in 90 - 110 kHz (kilohertz) Frequency Band]
LIS	Logistics and Inventory System
L,P&HR	Labor, Personnel and Human Relations
LLWAS	Low Level Wind Shear Alert System
LOFF	LORANC Flight Following
LRR	Long Range Radar
MAFIS	Multiple En Route Automatic Flight Inspection System
MALS	Medium-Intensity Approach Lighting System
MALSR	Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights
MAPO	Maintenance Automation Program Office
MAR	Minimally Attended Radar
MAX-E	Modular X-ray System
MCC	Maintenance Control Center
MCI	Mode C Intruder
MDA	Minimum Descent Altitude
MILSTRIP	Military Standard Requisition and Issue Procedures
MLS	Microwave Landing System
MMS	Maintenance Management System
MNPS	Minimum Navigation Performance System

MODE S	Discrete Addressable Secondary Radar System with Data Link
MODE-S	Mode Select Air Traffic Control Radar Beacon System
MOPS	Minimum Operational Performance Standard
MPS	Maintenance Processor Subsystem
MSL	Mean Sea Level
MTD	Moving Target Detection
MWP	Meteorological Weather Processor
NAD	North American Datum
NADIN	National Airspace Data Interchange Network
NARE	National Airspace Review Enhancement
NARACS	National Radio Communications System
NAS	National Airspace System
NASA	National Aeronautics and Space Administration
NASP	National Airspace System Plan
NASPAC	National Airspace System Performance Analysis Capability
NATCOM	National Communications Center, Kansas City, Missouri
NAVAID	Navigational Aid
NAVSTAR	Navigation System Using Timing and Ranging
NBS	National Bureau of Standards
NCU	Navigational Computer Unit
NDB	Non Directional Beacon
NEPA	National Environmental Policy Act
NEXRAD	Next Generation Weather Radar
NFDC	National Flight Data Center
NFIC	National Facilities Information Systems
NGS	National Geodetic Survey
NIH	National Institutes of Health
NMR	Nuclear Magnetic Resonance
NOS	National Ocean Service
NOTAM	Notice to Airmen
NPIAS	National Plan of Integrated Airport System
NPRM	Notice of Proposed Ruling
NSDD	National Security Decision Directives
NSEP	National Security Emergency Preparedness
NSSF	National Airspace System Simulation Support Facility
NTSB	National Transportation Safety Board
NWS	National Weather Service
OCAT	Oklahoma City Airport Trust
OCR	Optical Character Reader
ODAPS	Oceanic Display and Planning System
OFDPS	Offshore Flight Data Processing Systems
OMB	Office of Management and Budget
OSHA	Occupational Safety and Health Administration
OMEGA	Very Low Frequency, Continuous Wave Radio Navigation System Operating in 10 -14 KHZ Frequency Range
OPM	Office of Personnel Management
OWCP	Office of Workers' Compensation Program
PAPI	Precision Approach Path Indicator
PCB	Polychlorinated Biphenyl
PCB	Printed Circuit Board

PC&B	Personnel Compensation and Benefits
PCRM	Parallel and Converging Runway Monitors
PCS	Permanent Change-of-Station
PCS	Power Conditioning System
PDME	Precision Distance Measuring Equipment
PL	Public Law
PMIS	Personnel Management Information System
PMS	Performance Management System
PPI	Plan Position Indicators
PRMS	Performance Management and Recognition System
R&D	Research and Development
RAIL	Runway Alignment Indicator Lights
RAPCON	Radar Approach Control
RASS	Radar Analysis Software System
RBDE	Broadband Radar Remoting and Display Equipment
RCAG	Remote Center Air/Ground Communications Facility
RCE	Radio Control Equipment
RCF	Remote Communications Facility
RCL	Radio Communications Link
RCMS	Runway Configuration Management System
RCO	Remote Communications Outlet
R&D	Research and Development
REAP	Records Examination Assistance Program
R,E&D	Research, Engineering and Development
REIL	Runway End Identification Lights
RFI	Radio Frequency Interference
RFP	Request for Proposal
RML	Radar Microwave Link
RMLR	Radar Microwave Link Repeater
RMLT	Radar Microwave Link Terminal
RMM	Remote Maintenance Monitoring
RMMS	Remote Maintenance Monitoring System
RMS	Remote Monitoring Subsystem
RNAV	Area Navigation
RSPA	Research and Special Programs Administration
RTCA	Radio Technical Communication for Aeronautics
RTF	Radar Training Facility
RTR	Remote Transmitter/Receiver
RVR	Runway Visual Range
RVV	Runway Visibility Value
SAFE	Safety Activity Functional Evaluation
SARPS	Standards and Recommended Practices
SBIR	Small Business Innovative Research
SCFM	Standard Cubic Feet Per Minute
SEI	System Engineering and Integration
SFO	Single Frequency Outlet
SIAP	Standard Instrument Approach Procedure
SIDP	Supervisory Identification and Development Program
SMP	Special Maintenance Project
SPCC	Spill Prevention Counter Measure and Control
SRAP	Senor Receiver and Processor

SSB	Single Side Band
SSR	Secondary Surveillance Radar
SSR	Solid-State Radiation
STAR	Southern California Terminal Airspace Realignemt
SUA	Special Use Aircraft
TAA	Terminal Advanced Automation
TAC	Technical Activities Committees
TACAN	Tactical Air Navigation
TATCA	Terminal Air Traffic Control Automation
TCA	Terminal Control Areas
TCAS	Traffic Alert and Collision Avoidance System
TCCC	Tower Control Computer Complex
TDWR	Terminal Doppler Weather Radar
TELCO	Telephone Company
TELPAK	Telephone Package
TERPS	Terminal Instrument Procedures
TM&O	Telecommunications, Management and Operations
TMS	Traffic Management System
TMU	Traffic Management Unit
TRACAB	Terminal Radar Approach Control in the Tower Cab
TRACON	Terminal Radar Approach Control
TRB	Transportation Research Board
TSC	DOT Transportation System Center
TSSC	Technical Support Services Contract
TVOR	Terminal Very High Frequency Omni- Directional Radio Range
TXP	Military Designation for a Radar Beacon Processing System
UAS	Uniform Accounting System
UHF	Ultra High Frequency
UPS	Uniform Payroll System
USAF	United States Air Force
USCG	United States Coast Guard
VASI	Visual Approach Slope Indicator
VDP	Visual Descent Point
VFR	Visual Flight Rules
VHF	Very High Frequency
VMC	Visual Meteorological Conditions
VOLMET	Meteorological Information for Aircraft in Flight
VOR	Very High Frequency Omnidirectional Radio Range
VORTAC	VOR Co-located and TRACON
VOT	VHF Omnidirectional Range Test
VRS	Voice Response System
VSCS	Voice Switching and Control System
WCP	Weather Communications Processor
WIGS	Within - Grade Salary Increases
WMSC	Weather Message Switching Center
WPMS	Work Program Management system
WX	Weather

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

AIRCRAFT FLEET (End of Year Totals)

	TYPE OF AIRCRAFT	NO. OF ENGINES AND ENGINE TYPE	ACTUAL 9/30/89	ESTIMATE 9/30/90 b/	ESTIMATE 9/30/91
1.	FAA Owned -				
a.	Flight Inspection and Logistics				
	Boeing B-727	3 Jet	1	1	1
	Rockwell Int'l Sabre 40	2 Jet	3	3	3
	Rockwell Int'l Sabre 80	2 Jet	7	5	5
	Rockwell Int'l AC-1121	2 Jet	3	1	1
	Convair CV-580	2 Turboprop	2	3	3
	Beech BE-300	2 Turboprop/Jet	19	19	19
	Beech F-90	2 Turboprop	2	2	2
	Douglas DC-3	2 Piston	1	1	1
			38	35	35
b.	Evaluation, Currency, Transportation				
	Grumman G-159 a/	2 Turboprop	1	1	1
	Beech C-90	2 Turboprop	5	5	5
	Cessna CE-500 a/	2 Jet	1	1	1
	Cessna CE-550 a/	2 Jet	1	1	1
	Rockwell Int'l AC-1121	2 Jet	0	2	2
	Gulfstream IV	2 Jet	0	1	1
			8	11	11

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

AIRCRAFT FLEET

TYPE OF AIRCRAFT	NO. OF ENGINES AND ENGINE TYPE	ACTUAL 9/30/89	ESTIMATE 9/30/90 b/	ESTIMATE 9/30/91
c. Training				
Rockwell Int'l Sabre 40	2 Jet	1	1	1
Douglas DC-9	2 Jet	1	1	1
Beech F-90	2 Turbojet	2	2	2
Rockwell Int'l AC-1121	2 Jet	1	1	1
Lockheed L-1329/731 b/	4 Jet	1	1	1
Grumman G-159	2 Turboprop	1	1	1
		7	7	7
d. Research and Development				
Boeing B-727	3 Jet	1	1	1
Aero Commander AC-680	2 Piston	1	1	1
Convair CV-580	2 Turboprop	3	2	2
Sikorsky S-76	2 Turbo Rotors	1	1	1
Beech BE-200	2 Turboprop	1	1	1
Bell UH-1H Helicopter	1 Turborotor	1	1	1
		8	7	7
Total FAA Owned		61	60	60
2. FAA Lease/Purchase				
a. Evaluation, Currency, Transportation				
Gulfstream IV	2 Jet	1	0	0
Total FAA Lease		1	0	0

OPERATIONS APPROPRIATION

Administration of Aviation Standards Program

AIRCRAFT FLEET

TYPE OF AIRCRAFT	NO. OF ENGINES AND ENGINE TYPE	ACTUAL 9/30/89	ESTIMATE 9/30/90 b/	ESTIMATE 9/30/91
3. FAA Loan				
a. Research & Development				
Beechcraft T-34C	1 Turboprop	1	1	1
b. Flight Inspection				
Rockwell Int'l Sabre 80	2 Jet	1	2	2
Total FAA Loaned		2	3	3
TOTAL FAA FLEET		64	63	63

a/ Aircraft Mission, also training.
b/ Aircraft on Loan to United States Marshals Service.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Research, Engineering and Development Program
(Budget Authority)

	FY 1990 Estimate		FY 1991 Request		Difference	
	POS	Amount	POS	Amount	POS	Amount
Operations Appropriation: Administrative Program						
Development Direction: Planning, Direction an Evaluation	40	4,263,100	45	4,596,300	5	333,200
Direction, Staff and Supporting Services: Technical Center	48	3,084,000	48	3,133,000	0	49,000
Subtotal	88	7,347,100	93	7,729,300	5	382,200
Research, Engineering and Development Appropriation:						
Air Traffic Control	305	92,948,000	344	103,746,000	39	10,798,000
Advanced Computer	102	17,778,000	62	19,141,000	(40)	1,363,000
Navigation	21	2,630,000	20	3,359,000	(1)	729,000
Aviation Weather	21	13,111,000	20	7,739,000	(1)	(5,372,000)
Aviation Medicine	74	6,450,000	83	6,473,000	9	23,000
Aircraft Safety	122	35,276,000	139	47,142,000	17	11,866,000
Environment	0	1,970,000	0	2,400,000	0	430,000
Subtotal	645	170,163,000	668	190,000,000	23	19,837,000
Total Research, Engineering and Development	733	177,510,100	761	197,729,300	28	20,219,200

FEDERAL AVIATION ADMINISTRATION
Technical Center

	1990		1991	
	Pos.	Amount	Pos.	Amount
RESEARCH, ENGINEERING AND DEVELOPMENT:				
Conduct of test and evaluation (Research, Engineering and Development)	369	37,564,000	383	47,142,000
Development Direction (Operations)	11	912,000	11	983,000
Subtotal	380	38,476,000	394	48,125,000
FACILITIES AND EQUIPMENT:				
Test facilities and improvements	235	35,739,000	287	29,767,000
OPERATIONS:				
Human Resource Management				
Centralized Training and Labor, Personnel and Human Relations	25	1,948,000	25	2,029,000
NAS Logistics Support				
Material, procurement, management	44	3,033,314	44	3,063,600
Systems Maintenance				
Technical Center	208	18,323,374	208	19,056,309
Air Traffic				
National data systems	190	8,761,000	190	8,914,000
Technical Center Operations				
Medical program	2	63,000	2	83,000
Supervision, administration and maintenance of the Center	109	16,536,086	109	16,719,600
(NAS Logistics Support)	61	13,452,086	61	13,586,600
(Direction, Staff and Support)	48	3,084,000	48	3,133,000
Subtotal	111	16,599,086	111	16,802,600
Total Program, Technical Center	1,163	122,879,774	1,259	127,757,509
Distributed by Appropriation				
Operations	589	49,576,774	589	50,848,509
Facilities and Equipment	235	35,739,000	287	29,767,000
Research, Engineering and Development	369	37,564,000	383	47,142,000
Total	1,193	122,879,774	1,259	127,757,509

FEDERAL AVIATION ADMINISTRATION
Mike Monroney Aeronautical Center

	1990		1991	
	Pos.	Amount	Pos.	Amount
Centralized Training:	537	97,029,700	537	94,116,700
FAA Depot:				
Material, procurement, project management and shops	802	112,145,000	803	115,956,000
(Operations-NAS Logistics)	755	80,415,000	755	81,219,000
(Facilities and Equipment)	47	31,730,000	48	34,737,000
Civil Aeromedical Operations and Research:				
Operations	114	4,352,000	114	4,512,000
Direct research at Civil Aeromedical Institute Laboratories (Research, Engineering and Development)	71	5,919,000	80	5,240,000
Subtotal	185	10,271,000	194	9,752,000
Aviation Standards:				
Certification	19	967,000	19	1,007,000
Operations and Maintenance	82	6,439,900	82	6,611,900
Records servicing and analysis	98	4,004,000	141	5,626,000
Operation, maintenance, modification and overhaul of aircraft	807	90,723,000	811	95,516,000
(Operations)	778	76,976,000	782	64,227,000
(Facilities and Equipment)	29	13,747,000	29	31,289,000
Subtotal	1,006	102,133,900	1,053	108,760,900
Aeronautical Center Operations:				
NAS Logistics Support	126	19,355,000	126	19,549,000
Direction, Staff and Support	272	22,264,300	272	22,621,000
Human Resource Management Div.	47	2,100,800	47	2,189,800
Subtotal	445	43,720,100	445	44,359,800
Systems:				
Airway engineering support	61	6,780,032	61	7,051,285
Total Program, Aeronautical Center	3,036	372,079,732	3,093	379,996,685
Distribution by Appropriation:				
Operations	2,889	320,683,732	2,936	308,730,685
Facilities and Equipment	76	45,477,000	77	66,026,000
Research, Engineering and Development	71	5,919,000	80	5,240,000
Total	3,036	372,079,732	3,093	379,996,685

FEDERAL AVIATION ADMINISTRATION
Mike Monroney Aeronautical Center

Centralized Training

Included under this heading are:

FAA Academy - The focal point for training the agency's technical workforce. Resident and non-resident training are provided in air traffic control, facility maintenance, flight, and flight related technical subjects. Field training efforts are supported through Computer Based Instruction and correspondence study and centralized development of on-the-job training materials.

Transportation Safety Institute - Here, training in accident and incident investigations, regulatory compliance techniques for all modes of transportation, and aviation security is provided for employees of several modal administrations within the Department of Transportation.

Center for Management Development - The central point for the development and conduct of supervisory and managerial training for all FAA supervisory and management personnel. Courses are also designed to keep supervisors and managers current on newly developed supervisory and management practices and concepts, and improvements in human relations skills. This training center is located in Palm Coast, Florida.

FAA Depot

Included under this heading are the staffing and funding required for the warehousing, procurement, distribution and material control functions necessary to furnish supplies, spare parts and components for the day-to-day maintenance and operation of air navigation and air traffic control facilities, and agency aircraft (other than aircraft utilized for research and development). The work also involves packaging and shipping of facility components to sites where new facilities are being installed or relocated. Shop operations are conducted for the repair and overhaul of navigation aids, air traffic control and communication equipment; as well as providing maintenance support of technical equipment used at the FAA Academy for training programs.

Civil Aeromedical Institute

The Civil Aeromedical Institute (CAMI) is devoted to aeromedical operations and research activities. Operational activities include (1) review, recordation, information retrieval and adjudication of airman medical certification, (2) operation of the aviation medical examiner system, (3) employee and occupational health services for all Aeronautical Center employees, (4) industrial hygiene and the occupational health portion of the Occupational Safety and Health Act for all FAA activities in the western United States, (5) conduct of the airman medical education program, (6) collection and evaluation of aircraft accident investigation data, and (7) direction of the aeromedical research program.

The aeromedical research activity is comprised of four laboratories -- toxicology, physiology, psychology, and protection and survival. The primary objectives of this research activity are to: (1) increase the effectiveness of pilot and aircrew, (2) develop improved means for aircrew and passenger survivability during aircraft emergencies, (3) promote improvement of the role of the human operator in the air traffic control system and for the aviation safety inspection, and (4) study human factors on maintenance and testing of air carrier aircraft (aging aircraft).

Aviation Standards

Aviation Standards functions performed at the Aeronautical Center include the issuance of airmen certificates, registration of aircraft, and recordation of conveyance affecting title to U.S. aircraft and components.

Functions performed at the Aviation Standards National Field Office include the promotion of safety of flight by assuring the adequacy and accuracy of air navigation facilities; development and standardization of flight procedures; maintenance and engineering of the FAA aircraft fleet; and provision of regulatory and standards development.

Aeronautical Center Operations

This program provides local human resource management, staff and supporting services to all of the operating programs located at the Aeronautical Center. The activities included are Direction and Management, Civil Rights, Legal, Budget, Public Affairs, Personnel Management, Labor Relations, Management Systems, Accounting, Administration Services, Data Systems, Printing, Maintenance of Buildings and Grounds, and Penalty Mail. This also includes common use goods and services such as furniture, supplies, GSA store purchases, equipment, etc., for the various organizations located at the center.

Systems Maintenance

The National Airway Engineering Field Support Sector provides for accomplishment of technical engineering functions in support of regional field facility maintenance elements. Primary functional responsibilities are (1) preparing and updating technical maintenance manuals for use throughout the system, and (2) the engineering design and preparation of facility modifications assigned to the Airway Facilities organization. Additionally, location of this function at the Aeronautical Center has the added advantage of providing the engineers involved with direct access to the equipment with which the manuals and modification are concerned.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS
OBJECT CLASS - FY 1991 CONGRESSIONAL SUBMISSION
(Dollar Amounts in Thousands)

	GRAND TOTAL		AIR TRAFFIC		NAS LOGISTICS SUPPORT		SYSTEMS MAINTENANCE	
	1990	1991	1990	1991	1990	1991	1990	1991
FULL-TIME PERMANENT	1,984,352	2,138,864	1,124,729	1,209,999	50,767	52,471	401,612	427,974
OTHER THAN FULL-TIME PERM.	24,908	26,407	10,740	11,613	1,412	1,644	3,770	3,920
OTHER PERS. COMP.	234,188	250,302	177,079	191,478	1,614	1,849	42,110	42,360
REIMBURSABLE DETAILS	679	575	0	0	0	5	498	498
SUBTOTAL PERS. COMP.	2,244,127	2,416,148	1,312,548	1,413,090	53,793	55,969	447,990	475,352
PERS. BENEFITS	523,557	572,354	284,345	311,966	9,561	10,005	78,500	85,231
BENEFITS TO FORMER PERS.	1,241	1,243	27	29	0	0	13	13
TRAVEL	103,562	105,052	7,915	8,633	1,237	1,292	17,364	18,083
TRANSPORTATION OF THINGS	23,094	24,105	4,903	5,348	3,426	3,530	11,204	11,668
STANDARD LEVEL USER CHARGES	38,011	45,406	0	0	38,011	45,406	0	0
RENTAL PAYMENTS TO OTHERS	37,286	38,462	0	0	3,198	3,338	23,327	24,143
COMM.,UTILITIES & MISC.	305,445	326,389	1,810	1,974	4,938	6,677	48,669	50,838
PRINTING & REPRODUCTION	11,869	12,431	800	873	0	0	535	557
OTHER SERVICES	429,245	438,162	96,337	106,765	44,086	41,746	68,541	68,449
SUPPLIES AND MATERIAL	73,111	75,632	2,347	2,560	46,435	47,998	11,075	11,534
EQUIPMENT	33,306	31,800	1,518	1,656	1,615	1,197	6,359	5,180
LANDS & STRUCTURES	119	120	0	0	0	0	118	119
INSURANCE CLAIMS & INDEM.	386	396	318	347	4	4	5	5
TOTAL, ALL OBJECTS	3,824,339	4,087,700	1,712,868	1,853,241	206,304	217,162	713,700	751,172

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS
OBJECT CLASS - FY 1990 CONGRESSIONAL SUBMISSION
(Dollar Amounts in Thousands)

	LEASED TELECOMMUNICATIONS		ADMINISTRATION OF AVIATION STANDARDS		DEVELOPMENT DIRECTION		ADMINISTRATION OF AIRPORTS PROGRAM	
	1990	1991	1990	1991	1990	1991	1990	1991
FULL-TIME PERMANENT	0	0	251,105	286,232	8,658	9,096	22,612	23,869
OTHER THAN FULL-TIME PERM.	0	0	2,199	2,215	269	208	849	874
OTHER PERS. COMP.	0	0	8,070	8,356	255	283	419	432
REIMBURSABLE DETAILS	0	0	(531)	(531)	381	247	7	8
SUBTOTAL PERS. COMP.	0	0	259,151	294,053	9,563	9,834	23,887	25,183
PERS. BENEFITS	0	0	56,141	65,467	1,522	1,396	3,923	4,110
BENEFITS TO FORMER PERS.	0	0	0	0	0	0	0	0
TRAVEL	0	0	15,423	16,211	497	521	1,352	1,250
TRANSPORTATION OF THINGS	0	0	2,437	2,472	103	71	150	150
STANDARD LEVEL USER CHARGES	0	0	0	0	0	0	0	0
RENTAL PAYMENTS TO OTHERS	46	46	7,981	8,212	0	0	313	313
COMM.,UTILITIES & MISC.	235,652	251,806	3,016	3,245	0	0	67	67
PRINTING & REPRODUCTION	0	0	143	146	5	5	20	20
OTHER SERVICES	24,623	24,692	62,570	65,345	2,761	2,966	7,458	7,312
SUPPLIES AND MATERIAL	114	114	8,971	9,282	95	110	125	125
EQUIPMENT	7,203	7,203	3,706	3,750	375	418	420	389
LANDS & STRUCTURES	0	0	1	1	0	0	0	0
INSURANCE CLAIMS & INDEM.	0	0	34	35	0	0	1	1
TOTAL, ALL OBJECTS	267,638	283,861	421,266	470,438	14,921	15,321	37,716	38,920

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
OPERATIONS
OBJECT CLASS - FY 1990 CONGRESSIONAL SUBMISSION
(Dollar Amounts in Thousands)

	DIRECTION, STAFF, AND SUPPORTING SERVICES		HUMAN RESOURCE MANAGEMENT		HEADQUARTERS ADMINISTRATION	
	1990	1991	1990	1991	1990	1991
FULL-TIME PERMANENT	48,858	50,512	57,084	60,212	18,927	19,604
OTHER THAN FULL-TIME PERM.	2,609	2,697	2,238	2,358	822	878
OTHER PERS. COMP.	2,053	2,231	1,958	2,063	630	650
REIMBURSABLE DETAILS	108	112	40	40	176	196
SUBTOTAL PERS. COMP.	53,628	55,552	61,320	64,673	20,555	21,328
PERS. BENEFITS	9,232	9,545	77,346	81,496	2,987	3,333
BENEFITS TO FORMER PERS.	0	0	1,201	1,201	0	0
TRAVEL	2,976	2,933	55,594	55,025	1,204	1,104
TRANSPORTATION OF THINGS	262	262	526	521	83	83
STANDARD LEVEL USER CHARGES	0	0	0	0	0	0
RENTAL PAYMENTS TO OTHERS	2,115	2,108	301	297	5	5
COMM., UTILITIES & MISC.	10,918	11,409	225	223	150	150
PRINTING & REPRODUCTION	10,349	10,815	15	13	2	2
OTHER SERVICES	30,816	29,796	86,529	85,647	5,524	5,444
SUPPLIES AND MATERIAL	1,807	1,787	1,953	1,933	189	189
EQUIPMENT	6,751	6,751	5,109	5,056	250	200
LANDS & STRUCTURES	0	0	0	0	0	0
INSURANCE CLAIMS & INDEM.	3	3	1	1	0	0
TOTAL, ALL OBJECTS	128,857	130,961	290,120	296,086	30,949	31,838

U.S. Department of
Transportation

BUDGET ESTIMATES

FISCAL YEAR 1991

FEDERAL RAILROAD ADMINISTRATION

SUBMITTED FOR USE OF
THE COMMITTEES ON APPROPRIATIONS

FEDERAL RAILROAD ADMINISTRATION

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GENERAL STATEMENT

The Federal Railroad Administration (FRA) is requesting $69,579,000 in budget authority for FY 1991. The FY 1991 request is a decrease of $640,598,000 from FRA's FY 1990 appropriation level.

The FY 1990 enacted appropriations included $629,127,000 to continue funding for Grants to the National Railroad Passenger Corporation (Amtrak) and the Northeast Corridor Improvement Program. No funds are requested for these programs in FY 1991 due to budget constraints and the need for Amtrak to operate self-sufficiently. In addition, no funding is requested to continue the special rail improvement projects in the Conrail Commuter Transition Assistance, Amtrak Corridor Improvement Loans, and Local Rail Service Assistance programs.

The Railroad Safety Improvement Act (RSIA), enacted on June 22, 1988, requires FRA to issue implementing rules, as may be necessary. FRA has issued seven final rules and four proposed rules are in the rulemaking process. This rulemaking activity is creating an unusually large increase in our safety inspection and enforcement workloads. The FY 1991 budget request provides the additional resources necessary to handle the expanded safety responsibilities.

FRA is currently developing a Congressionally-mandated report on the economic and technical feasibility of magnetic levitation (maglev) transportation systems in the United States. FRA is also conducting an evaluation of the safety aspects of the German maglev technology proposed for the Orlando, Florida project. Our FY 1991 request includes additional resources to expand on FRA's capabilities, and to establish a strategic plan for assessment of a U.S. technology-based, high speed, maglev transportation system in concert with U.S. industries and State and local governments.

On February 28, 1989, the Department transmitted to Congress a report on the infrastructure needs of the regional and shortline railroads operating over 29,000 miles of track. The report traced the growth of Class II and Class III railroads, which currently number 487 operators, since 1980. FRA believes that these railroads are a necessary complement to the major Class I railroads and, together, an important service to the overall national defense of our country, provide essential services to small cities and towns and rural areas, and have a critical role in helping to solve the Nation's transportation problems and safe movement of hazardous materials. FRA's FY 1991 request includes, therefore, additional contract resources to provide technical assistance to the regional and shortline railroads to improve the safety and efficiency of their operations.

The FY 1991 request also provides additional funding to cover comparability pay adjustments for FRA and other federal agency employees. These adjustments include the full year costs of the January 1990 pay increase (3.6 percent) and one-half of the proposed January 1991 pay increase (3.5 percent) that would be effective during the fiscal year. The request assumes that the other half of the 1991 pay increase will be absorbed.

The accompanying tables and narrative justifications provide a complete and detailed description of the FY 1991 request. The changes in staffing and program funding in each appropriation are highlighted in the following paragraphs.

Staffing. For FY 1991, FRA is requesting 709 permanent positions and 685 full-time equivalents (FTEs) in our direct appropriations and three reimbursable. This request represents increases of 12 positions and 51 staff years (FTEs) over the FY 1990 enacted levels. The increases are primarily safety-related and are critical to the implementation of our safety authority, including the expansion of FRA's regulatory and enforcement responsibilities mandated by the RSIA, and a new safety inspector training program to be initiated in FY 1990 within available resources. The request also includes three reimbursable positions and FTEs to provide continued support to the U.S. Air Force on the Peacekeeper Rail Garrison Program.

Because of the increases in the safety inspection workload and the implementation of a new training program, FRA is requesting 498 permanent positions and 481 FTEs for the Railroad Safety appropriation. The FY 1991 request will provide for 373 field inspector positions, 58 field clerical positions, and 67 headquarters positions. The request not only provides for 12 new safety inspector training positions and FTEs, but also permits FRA to annualize 35 of the 47 previously authorized positions. These staffing increases will enhance FRA's ability to address our inspection and enforcement responsibilities under the random testing rule, licensing of engineers, individual liability, and other RSIA mandates.

For the Railroad Research and Development appropriation, FRA is requesting 16 permanent positions and FTEs. An additional engineer is requested to provide FRA with expertise on new high speed and maglev technologies.

For the Office of the Administrator direct account, FRA is requesting 192 permanent positions and 185 FTEs. The FY 1991 staffing level reflects a reduction of four positions that have remained unfunded in recent fiscal years because of the expiration and phased termination of financial assistance programs.

The following paragraphs highlight the major funding increases by appropriation.

Office of the Administrator. FRA's FY 1991 request for $15,807,0000 is a decrease of $5,761,000 from FY 1990 which includes the Local Rail Service Assistance (LRSA) program. The increases in this account include $755,000 to cover mandatory cost adjustments in administrative expenses such as salaries, benefits, office space rental charges, and travel and per diem rate increases, and a net decrease of $6,516,000 in program changes due to non-recurring appropriations for LRSA and High Speed Technical Assistance.

For Salaries and Expenses, the FY 1991 request for $14,063,000 includes increases of $755,000 in mandatory cost adjustments and $144,000 in program changes. The program changes reflect incremental funding for planned office automation improvements, technical support services, and reimbursable services to DOT and other Federal agencies.

The Contract Support request for $1,000,000 provides $75,000 in additional funding in FY 1991 for the Freight Services contract program for technical assistance to regional and shortline freight railroads in critical areas of safety and track and equipment maintenance.

For FY 1991, FRA is requesting $744,000 to reimburse the Department of Labor (DOL) for compensation payments made to former Federal employees of the Alaska Railroad. The Department is required by statute to request an appropriation to reimburse DOL for these annual compensation payments.

Railroad Safety. FRA's FY 1991 request for $36,500,000 is an increase of $5,005,000 over FY 1990. The increases in this appropriation include $1,471,000 in proposed program changes and $3,534,000 to cover mandatory cost adjustments in administrative expenses such as salaries, benefits, office space rental charges, travel and per diem rate increases.

The Federal Enforcement request totals $28,895,000 and 431 positions, which includes a field staff of 373 professional and trainee positions and 58 clerical support positions. The adjustments include an additional $978,000 for 17 FTEs for annualization of the 38 new positions (21 FTEs) requested in the FY 1990 budget submission and another $1,984,000 to cover mandatory cost increases in administrative expenses. The program changes include $593,000 for 11 unfunded FTEs and $612,000 for 12 new trainee FTEs. Other program changes include additional funding of $234,000 for portable computers and $32,000 for office automation support services. The planned computer purchases restore the $234,000 approved for equipment acquisitions in the FY 1990 budget but which is being used to partially defray the impact of the FY 1990 sequestration.

For the Automated Track Inspection Program (ATIP), FRA requests $1,203,000 to continue operation of the self-propelled (T-10) vehicle for surveying about 28,000 miles of passenger, hazardous materials, and other priority traffic routes. The FY 1991 request reflects an increase of $43,000 in operating and maintenance expenses.

The Safety Regulation and Program Administration request totals $6,402,000 and 67 positions, which provides a headquarters staff of 55 professionals and 12 clerical support personnel. The adjustments include $253,000 for seven unfunded FTEs. Another $319,000 is required to cover mandatory cost increases in administrative expenses. Contractual support for data management, alcohol and drug testing programs, and planning and evaluation activities have a combined reduction of $50,000. FRA is requesting $600,000 for its alcohol and drug testing program.

Legislation is being proposed to phase in Railroad Safety user fees during the FY 1991-92 period. The user fees will be assessed based on each railroad's share of gross operating revenues. In FY 1991, these fees are estimated to equal $20 million in proprietary receipts.

Railroad Research and Development. For FY 1991, FRA is requesting $16,984,000, including $6,150,000 to conduct safety, economic and other technical assessments of high speed rail systems and to develop a strategy for promoting private sector involvement in financing and constructing maglev transportation systems. The request will also provide $1,500,000 for environmental clean up of a waste water lagoon at the Pueblo, Colorado Transportation Test Center.

Legislative Requirements. FRA will request legislation to reauthorize Railroad Safety appropriations and activities.

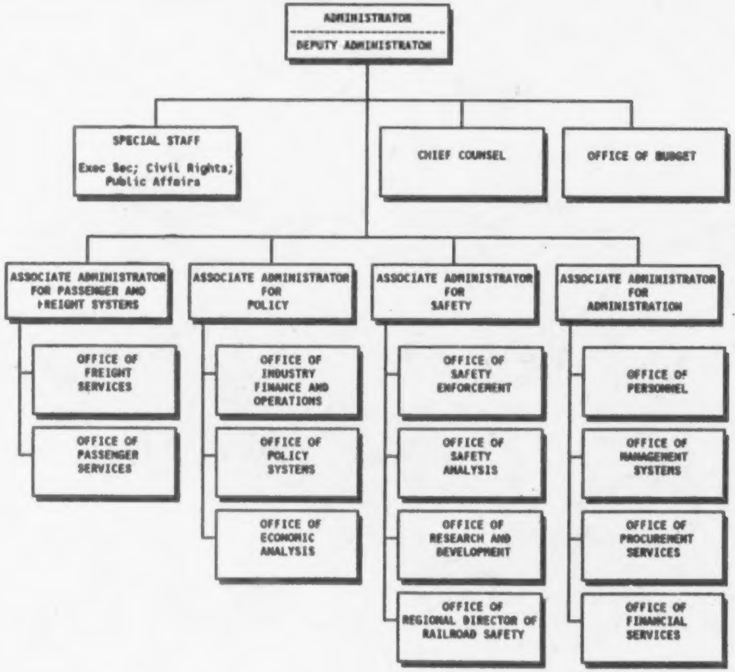
Rental Payments to GSA. FRA's FY 1991 budget request for $3,006,000 consists of $1,415,000 for the Office of the Administrator, $1,504,000 for Railroad Safety, and $87,000 for Railroad Research and Development.

Office of the Secretary's Working Capital Fund. FRA's FY 1991 budget request for $1,408,000 consists of $1,019,000 for the Office of the Administrator, $337,000 for Railroad Safety, and $52,000 for Railroad Research and Development.

Consulting Services. FRA's FY 1991 request contains $1,817,000 for advisory and assistance services, as defined by OMB Circular A-120. The Office of the Administrator appropriation request includes $1,067,000 in consulting services for technical support and training in office automation systems, rail network model modifications, and economic related studies. The Railroad Safety appropriation request includes $750,000 in consulting services for alcohol and drug testing and oversight and technical support and training in office automation systems.

The following tables provide a current organization chart and comparisons of funding and staffing for FY 1989, FY 1990, and FY 1991.

FEDERAL RAILROAD ADMINISTRATION


ADMINISTRATOR
DEPUTY ADMINISTRATOR
SPECIAL STAFF
Exec Sec; Civil Rights; Public Affairs
CHIEF COUNSEL
OFFICE OF BUDGET
ASSOCIATE ADMINISTRATOR FOR PASSENGER AND FREIGHT SYSTEMS
OFFICE OF FREIGHT SERVICES
OFFICE OF PASSENGER SERVICES
ASSOCIATE ADMINISTRATOR FOR POLICY
OFFICE OF INDUSTRY FINANCE AND OPERATIONS
OFFICE OF POLICY SYSTEMS
OFFICE OF ECONOMIC ANALYSIS
ASSOCIATE ADMINISTRATOR FOR SAFETY
OFFICE OF SAFETY ENFORCEMENT
OFFICE OF SAFETY ANALYSIS
OFFICE OF RESEARCH AND DEVELOPMENT
OFFICE OF REGIONAL DIRECTOR OF RAILROAD SAFETY
ASSOCIATE ADMINISTRATOR FOR ADMINISTRATION
OFFICE OF PERSONNEL
OFFICE OF MANAGEMENT SYSTEMS
OFFICE OF PROCUREMENT SERVICES
OFFICE OF FINANCIAL SERVICES

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
RESOURCE SUMMARY - FINANCING (BUDGET AUTHORITY)

($ in thousands)

APPROPRIATION TITLE	BUDGET AUTHORITY		
	1989 Actual	1990 Estimate	1991 Estimate
Office of the Administrator.......	$20,852	$21,568	$15,807
Railroad Safety..................	27,825	31,495	36,500
Railroad Research and Development.	9,286	9,489	16,984
Freightline Rehabilitation........	6,000	...	...
Conrail Commuter Transition Assistance......................	4,500	4,920	...
Settlements of Railroad Litigation	213	226	265
Northeast Corridor Improvement Program.........................	19,600	24,442	...
Grants to the National Railroad Passenger Corporation (Amtrak)...	584,000	604,685	...
Amtrak Corridor Improvement Loans..	...	3,490	...
Alaska Railroad Revolving Fund.....	...	...	...
Regional Rail Reorganization.......	...	9,862	23
Railroad Rehabilitation and Improvement Financing Funds......	...	...	...
Total Budget Authority.............	$672,276	$710,177	$69,579

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
RESOURCE SUMMARY - FINANCING (NET OBLIGATIONS)
($ in thousands)

APPROPRIATION TITLE	NET OBLIGATIONS		
	1989 Actual	1990 Estimate	1991 Estimate
Office of the Administrator.......	$27,253	$36,310	$15,807
Railroad Safety..................	28,097	31,745	36,500
Railroad Research and Development.	8,955	13,287	16,984
Freightline Rehabilitation........	6,000	...	...
Conrail Commuter Transition Assistance......................	4,500	4,920	...
Settlements of Railroad Litigation	213	226	265
Northeast Corridor Improvement Program........................	21,237	35,847	...
Grants to the National Railroad Passenger Corporation (Amtrak)..	574,300	647,973	...
Amtrak Corridor Improvement Loans.	...	3,490	...
Alaska Railroad Revolving Fund....	...	...	...
Regional Rail Reorganization......	...	9,862	23
Railroad Rehabilitation and Improvement Financing Funds 1/..	-96,668	-137,262	-18,052
Subtotal Obligations..............	$573,887	$646,398	$51,527
Proprietary receipts.............	...	...	-20,000
Total Obligations............	$573,887	$646,398	$31,527

1/ Includes proceeds from loan sale receipts of $83 million in 1989, $137.2 million in 1990, and $18 million in 1991.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
RESOURCE SUMMARY - FINANCING (OUTLAYS)
($ in thousands)

APPROPRIATION TITLE	OUTLAYS 1989 Actual	1990 Estimate	1991 Estimate
Office of the Administrator.......	$30,286	$40,813	$37,618
Railroad Safety..................	27,960	28,904	36,427
Railroad Research and Development.	7,019	15,178	15,250
Freightline Rehabilitation........	4,410	1,590	...
Conrail Labor Protection..........	-2	...	...
Conrail Commuter Transition Assistance....................	1,796	6,241	5,796
Settlements of Railroad Litigation	...	439	265
Northeast Corridor Improvement Program........................	41,438	42,617	43,993
Grants to the National Railroad Passenger Corporation (Amtrak)..	574,399	578,440	69,774
Amtrak Corridor Improvement Loans.	...	1,745	1,745
Alaska Railroad Revolving Fund....	322	239	...
Regional Rail Reorganization......	...	9,862	23
Railroad Rehabilitation and Improvement Financing Funds 1/..	-87,048	-124,262	-12,303
Subtotal Outlays.................	$600,580	$601,806	$198,588
Proprietary receipts.............	...	...	-20,000
Total Outlays...............	$600,580	$601,806	$178,588

1/ Includes proceeds from loan sale receipts of $83 million in 1989, $137.2 million in 1990 and $18 million in 1991.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
RESOURCE SUMMARY - STAFFING

	AUTHORIZED POSITIONS (FULL-TIME PERMANENT)		
DIRECT FUNDED, BY APPROPRIATION	1989	1990	1991
Office of the Administrator...	197	196	192
Railroad Safety...............	446	486	498
Railroad Research and Development.................	15	15	16
Total.........................	658	697	706
REIMBURSABLE			
Office of the Administrator	...	...	3
Total....................	658	697	709

	FTE TOTAL 1/		
DIRECT FUNDED, BY APPROPRIATION	1989	1990	1991
Office of the Administrator...	174	185	185
Railroad Safety...............	399	434	481
Railroad Research and Development.................	13	15	16
Total.........................	586	634	682
REIMBURSABLE			
Office of the Administrator	...	...	3
Total	586	634	685

1/ Includes 10 non-ceiling employees.

OFFICE OF THE ADMINISTRATOR

For necessary expenses of the Federal Railroad Administration, not otherwise provided for, [$14,589,000] $15,807,000, of which [$1,425,000] $1,744,000 shall remain available until expended[, and of which $500,000 shall be available for grants for up to 50 per centum of the cost of contractual support needed for private sector interstate high-speed rail projects, and for the Federal Railroad Administration to engage in studies relating to safety provisions of super-high-speed magnetic levitation systems]: Provided, That none of the funds in this Act shall be available for the planning or execution of a program making commitments to guarantee new loans under the Emergency Rail Services Act of 1970, as amended, and that no new commitments to guarantee loans under section 211(a) or 211(h) of the Regional Rail Reorganization Act of 1973, as amended, shall be made: Provided further, That, as part of the Washington Union Station transaction in which the Secretary assumed the first deed of trust on the property and, where the Union Station Redevelopment Corporation or any successor is obligated to make payments on such deed of trust on the Secretary's behalf, including payments on and after September 30, 1988, the Secretary is authorized to receive such payments directly from the Union Station Redevelopment Corporation, credit them to the appropriation charged for the first deed of trust, and make payments on the first deed of trust with those funds[: Provided further, That such additional sums as may be necessary, for payment on the first deed of trust, may be advanced by the Administrator from unobligated balances available to the Federal Railroad Administration, to be reimbursed from payments received from the Union Station Redevelopment Corporation].

[Local Rail Service Assistance]

[For necessary expenses for rail assistance under section 5(q) of the Department of Transportation Act, as amended, $7,000,000, to remain available until expended: **Provided**, That notwithstanding any provision of sections 5(f) through 5(p) of said Act, from such funds $36,000 shall be reserved for such eligible State for the purposes of either section 5(i) or section 5(h) of said Act, provided that timely application is made in accordance with procedures employed by the Secretary, and the balance of such funds are reserved for use only under sections 5(h)(3)(B)(ii) and 5(h)(3)(C) of said Act: **Provided further**, That no State may apply for fiscal year 1990 funds under section 5 of said Act until such State has obligated all funds granted to it under said section 5 in previous fiscal years.] (Department of Transportation and Related Agencies Appropriations Act, 1990.)

STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
OFFICE OF THE ADMINISTRATOR

Program and Financing (in thousands of dollars)

Identification code 69-0700-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
Direct program:			
00.01 Salaries and expenses...	12,063	13,164	14,063
00.02 Contract support.........	256	13,611	1/ 1,000
00.03 Washington Union Station	11,800	1,416	1,416
00.04 Local rail service assistance............	3,035	9,475	...
00.05 Alaska railroad workers' compensation payments.	...	...	744
00.06 Asset sale technical assistance............	99	60	...
00.91 Total direct program..	27,253	37,726	17,223
01.01 Reimbursable program....	1,124	2,222	975
10.00 Total obligations......	28,377	39,948	18,198
Financing:			
Offsetting collections from:			
11.00 Federal funds...........	-1,124	-2,222	-975
14.00 Non-Federal sources.....	...	-1,416	-1,416
17.00 Recovery of prior year obligations...........	-10,371	...	...
21.40 Unobligated balance available, start of year...............	-6,786	-14,742	...
22.40 Unobligated balance transferred, net......	-4,000	...	...
24.40 Unobligated balance available, end of year	14,742	...	...
25.00 Unobligated balance lapsing...............	14	...	...
39.00 Budget authority.....	20,852	14,589	15,807
Budget authority:			
40.00 Appropriation...........	20,852	14,589	15,807
40.00 Appropriation...........	...	7,000	...
40.00 Reduction pursuant to P.L. 101-164..........	...	-21	...
43.00 Appropriation (adjusted)	20,852	21,568	15,807

1/ Reflects anticipated settlement of contractor claims related to redevelopment of Washington Union Station.

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
OFFICE OF THE ADMINISTRATOR

Program and Financing (in thousands of dollars)

Identification code 69-0700-0-1-401	19 88 actual	19 89 estimate	19 90 estimate
Relation of obligations to outlays:			
71.00 Obligations incurred, net....................	27,253	36,310	15,807
72.40 Obligated balance, start of year...............	51,455	37,901	33,398
74.40 Obligated balance, end of year...............	-37,901	-33,398	-11,587
77.00 Adjustments in expired accounts..............	-151	...	...
78.00 Adjustments in unexpired accounts..............	-10,370	...	...
90.00 Outlays...............	30,286	40,813	37,618
Distribution of budget authority by account:			
Office of the Administrator	20,852	14,589	15,807
Local Rail Service Assistance	...	6,979	...
Distribution of outlays by account:			
Office of the Administrator	15,852	23,223	20,028
Local Rail Service Assistance	14,434	17,590	17,590
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OFFICE OF THE ADMINISTRATOR

PROGRAM AND PERFORMANCE

Salaries and expenses.-Provides for salaries and related expenses for the Office of the Administrator and the immediate staff, Chief Counsel, Civil Rights, Public Affairs, Office of Budget, Office of Administration, Office of Policy and the Office of Passenger and Freight Services. These offices resolve national problems confronting the railroad industry and support the Federal Railroad Administrator.

Contract support.-Contractual support is used to develop positions regarding structural industry changes such as mergers and to conduct internal studies dealing with traffic, economic forecasting, financial condition, labor-management activities and other factors that contribute to an efficient national freight railroad network.

Washington Union Station.-The Department of Transportation purchased Washington Union Station on November 1, 1988. Receipts are estimated to cover the mortgage payments in 1990 and 1991.

Local rail service assistance.-This program provides discretionary and formula grants to all States for rail planning and for track rehabilitation of light density lines. No funds are requested in 1991.

Alaska Railroad workers' compensation.-This program provides reimbursement to the Department of Labor for annual and lump-sum compensation payments to former Federal employees of the Alaska Railroad. The State of Alaska purchased the railroad from the Federal Government in 1985.

Asset sale technical assistance.-This program provides contractual support for financial advisors to assist in the sale of Section 505 loan securities. No funds are requested in 1991 since FRA is authorized to use loan sale proceeds for payment of sale expenses.

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
OFFICE OF THE ADMINISTRATOR

OBJECT CLASSIFICATION (in thousands of dollars)

Identification code 69-0700-01-401	19 actual 89	19 estimate 90	19 estimate 91
Direct obligations:			
Personnel compensation:			
11.1 Full-time permanent.......	7,741	7,697	8,497
11.3 Other than full-time permanent................	210	210	211
11.5 Other personnel compensation.............	129	129	130
11.9 Total personnel compensation...........	8,080	8,036	8,838
12.1 Civilian personnel benefits.................	1,100	1,460	1,693
13.0 Benefits for former personnel................	53	53	800
21.0 Travel and transportation of persons...............	207	120	130
22.0 Transportation of things..	10	1	1
23.1 Rental payments to GSA....	1,181	1,415	1,415
23.3 Communications, utilities, and miscellaneous charges	269	580	430
24.0 Printing and reproduction.	159	139	138
25.0 Other services............	12,706	16,316	3,564
26.0 Supplies and materials....	127	59	116
31.0 Equipment.................	326	72	98
41.0 Grants, subsidies, and contributions...........	3,035	9.475	...
99.0 Subtotal, direct obligations.............	27,253	37,726	17,223
99.0 Reimbursable obligations..	1,124	2,222	975
99.9 Total obligations........	28,377	39,948	18,198
(Memo ent: 31.0)	(Memo ent: 8)	(Memo ent: 1)	(Memo ent: 4.0)

STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
OFFICE OF THE ADMINISTRATOR

PERSONNEL SUMMARY

Identification code 69-0700-0-1-401	19 actual 89	19 estimate 90	19 estimate 91
Direct:			
Total number of full-time permanent positions........	197	196	192
Total compensable workyears: Full-time equivalent employment...............	174	185	185
Full-time equivalent of over-time and holiday hours.....	1	1	1
Reimbursable:			
Total number of full-time permanent positions........	...	...	3
Total compensable workyears..................	...	...	3
Average SES Salary.............	$76,820	$79,600	$97,700
Average GS grade...............	12.7	12.6	12.8
Average GS salary.............	$41,416	$41,276	$44,822

FEDERAL RAILROAD ADMINISTRATION
OFFICE OF THE ADMINISTRATOR

SUMMARY STATEMENT

This account provides salary and expense funds for Executive Direction and Administration, Policy Support, and Passenger and Freight Services functions under the Office of the Administrator appropriation. This account also includes funding for Contract Support, Washington Union Station, management of the remaining balances in Local Rail Service Assistance, and Alaska Railroad Workers' Compensation. Basic authorizing legislation for this account is contained in the Department of Transportation Act, Public Law No. 89-670.

Executive Direction and Administration provides top level direction necessary to resolve critical problems confronting the railroad industry and to accomplish FRA's goals and objectives. The organizational units are: the Immediate Office of the Administrator, Public Affairs, Office of Civil Rights, Office of Budget, Office of Chief Counsel, and the Office of Administration. Administration support functions include the Offices of Personnel, Management Systems, Procurement, and Financial Services.

The Office of the Chief Counsel, under the general professional supervision of the Office of the Secretary's General Counsel, provides legal advice and support to the Federal Railroad Administrator and other FRA officials and manages the Washington Union Station redevelopment program. The Office consists of lawyers, technicians and supporting secretarial staff. The Office is divided into the immediate office of the Chief Counsel, which handles legislation, budget, labor issues and special projects; the Legal Services Division, which provides legal services on FRA non-safety related matters; and the Safety Division, which handles all matters relating to safety enforcement, litigation, legislation and regulations, waivers, NTSB hearings and OSHA matters.

The Office of Policy develops rail transportation policies to assist in overcoming a variety of railroad freight and passenger service problems. These are approached through the collection and analysis of data, the conduct of studies, and the active dissemination of findings. FRA will continue to put emphasis on planning and developing a consistent body of government policies that will contribute to a safe, efficient and privately-owned national railroad network, while minimizing the burden on the general taxpayer. The Policy Support function also involves coordination of the rail element of the national program for the maintenance of an emergency transportation capability, in the event of natural disaster or defense emergency, pursuant to DOT and FEMA directives. In the event of an emergency, FRA would provide railroad transportation policy guidance to civil defense planners.

Passenger and Freight Services provides necessary expenses for rail service assistance authorized by section 5 of the Department of Transportation Act, as amended, and for necessary administrative expenses in connection with Federal financial assistance.

The following accomplishments were achieved during FY 1989:

- Played a key role in persuading the Supreme Court to uphold FRA's rules on the control of alcohol and drug use against a Fourth Amendment challenge (by a vote of 7-2).
- Issued seven new safety regulations and four proposed regulations for implementing provisions of the Rail Safety Improvement Act (RSIA) of 1988.
- Completed the repurchase of loan assets for which FRA realized over $90 million. Additional negotiations continued with remaining Class I and Shortline railroads.
- Assessed more than $5 million in claims against railroads and shippers for violations of the rail safety laws. Collected $4.66 million in civil penalties, the second highest amount since 1980.
- Completed a study on infrastructure conditions and rehabilitation needs of Class II and III railroads requested by the Appropriations Committees of the Senate and the House of Representatives. The report, Deferred Maintenance and Delayed Capital Improvements on Class II and Class III Railroads, was transmitted to Congress in February 1989.
- Monitored rail labor developments and prepared economic impact analyses of the Eastern Airlines and Chicago Northwestern Railroad strikes for the Secretary, the National Mediation Board and the White House.
- Completed a study of the potential movement of domestic intercity merchandise traffic in double stack trains and the financial, operational and institutional issues associated with the adoption of a container-based rail intermodal system. The study included the effects on railroads, ports and ocean carriers.
- Initiated drawdowns for the South Rail Corporation and the Dakota, Minnesota and Eastern to finance the Section 505 loan agreements entered into in September 1988. Drawdowns continued for other railroads

operating with existing Section 505 finance agreements. Monitored repayment schedules and conducted closeouts for completed projects.

- Completed a grant agreement with the Soo Line to improve Amtrak service between LaCrosse and Milwaukee, Wisconsin. The Soo Line matched the $6 million Federal grant for this track reconstruction project.
- Monitored the acquisition of the ICG Transportation Company, which includes the Illinois Central Railroad, by Prospect Group, Inc. Monitoring the takeover attempt of CNW Corp., which would include the CNW Railroad, by Japonica Partners, an investor group.
- Provided legal support for the successful purchase by the United States of the Washington Union Station; for the negotiation of a contract for the operation of the Washington Union Station Parking Garage; and for the successful settlement of contract claims related to Union Station construction.
- Concluded a negotiated settlement with the State of Colorado concerning hazardous materials storage and contamination at the Transportation Test Center.
- Provided legal support on environmental and historic preservation issues, such as Camden County Mayors' Assn. V. John H. Riley in which the Third Circuit Court of Appeals affirmed District Court decision in favor of the FRA on the proposed extension of Amtrak rail passenger service from Philadelphia to Atlantic City.
- Published a report on ride quality of tilt and turbo powered vehicles based on passenger surveys taken during tests on the Boston to New York segment of the Northeast Corridor. Assisted Amtrak and the Coalition of Northeastern Governors in the conduct of these tests and prepared an independent assessment.
- Amended the FRA grant agreement with the Southeastern Pennsylvania Transportation Authority (SEPTA) to provide an additional $4.5 million for bridge rehabilitation in the Philadelphia area.
- Amended the FRA/Amtrak NECIP grant agreement to provide an additional $19.5 million for NEC-related safety improvements. The funds will be used for extensions of the centralized electric train control system, installing seat locks and baggage restraints on passenger cars, installing event recorders and electronic warning devices on locomotives, upgrading communications and signal systems, and track improvements.

- Administered operating and capital funds provided to Amtrak and developed DOT positions for the Amtrak Board of Directors. Amtrak has continued to improve its revenue to cost ratio. The FY 1988 ratio was 69 percent, up from 47 percent in 1981 and is expected to reach 72 percent in FY 1989.

- Participated in DOT's planning and supporting activities in developing a National Transportation Plan, including the lead in intercity freight issues and outreach initiatives.

- Advised the U.S. Air Force on the safe operation of the Peacekeeper Rail Garrison train, consistent with the efficient operations of the railroads on the rail network.

FEDERAL RAILROAD ADMINISTRATION

OFFICE OF THE ADMINISTRATOR
(Dollars in thousands)

SUMMARY TABLE

	FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
Budget authority (Program level)	**$21,568**	**$15,807**	**$-5,761**

ADJUSTMENTS TO BASE AND PROGRAM CHANGES

	Program Level	Authorized Positions	FTEs
FY 1990 Base.	$21,568	196	185
Adjustments to Base:			
o Comparability pay adjustments	+686	...	...
o Within-grade, and merit pay increases	+208	...	...
o FICA/MEDICARE payments . .	+36	...	...
o Compensable Day.	+38	...	...
o Health insurance premiums.	+117	...	...
o Federal Employees' Compensation Fund. . . .	+3	...	...
o Working capital fund . . .	-357	...	...
o Travel	+10	...	...
o Common service costs . . .	+14	...	...
Subtotal, Adjustments to Base	+755	...	...

Program Changes:	Program Level	Authorized Positions	FTEs
o Non-recurring equipment purchases	$-72	...	...
o Position reductions	...	-4	...
o Office automation equipment purchases	+98	...	...
o Office automation support services.	+23	...	...
o Reimbursable services	+59	...	...
o Other contract services . . .	+36	...	...
o Freight Services Technical Assistance.	+75	...	...
o Alaska Railroad Workers' Compensation.	+744	...	...
o High Speed Technical Assistance.	-500	...	...
o Local Rail Service Assistance	-6,979	...	...
Subtotal, Program Changes	-6,516	-4	...
Subtotal, Increases or Decreases	-5,761	-4	...
Total FY 1991 Request.	**$15,807**	**192**	**185**

FEDERAL RAILROAD ADMINISTRATION

OFFICE OF THE ADMINISTRATOR

SUMMARY TABLE
(Dollars in thousands)

Program by Activities	FY 1990	FY 1991 Estimate Adjustments to Base	Program Changes	Total Request
Program Level:				
1. Salaries and Expenses....	$13,164	+$755	+$144	$14,063
2. Contract Support.........	925	...	+75	1,000
3. Alaska Railroad Workers' Compensation...........	...	...	+744	744
4. High Speed Technical Assistance.............	500	...	-500	...
5. Local Rail Service Assistance.............	6,979	...	-6,979	...
Total Program Level..........	$21,568	+$755	-$6,516	$15,807

1. SALARIES AND EXPENSES. $14,063

Background

This program area includes the salaries and related expenses to pay for the staff and support services required for the accomplishment of Office of the Administrator activities.

Program Structure and Objectives

This program is separated into four primary organizational units: Executive Direction and Administration; Office of Policy; and, Passenger and Freight Services. A discussion of these organizational units follows:

a. Executive Direction and Administration

The Executive Direction includes the functions of the Immediate Office of the Administrator, the Executive Secretariat, Office of Civil Rights, Office of Public Affairs, and Office of Budget. These organizations provide support and guidance to deal with critical policy issues confronting the railroad industry and maintains open communication with FRA personnel and the general public concerning FRA's activities. It also insures that all FRA programs attain a representative FRA work force which includes minorities and women in occupational series where under representation exists, and that FRA program resources are presented and implemented in accordance with Administration and Congressional mandates.

The Office of Chief Counsel, under the general professional supervision of the Office of the Secretary's General Counsel, provides the Federal Railroad Administrator and other FRA officials legal advice and support. This is accomplished through a variety of activities including: review of legal developments before courts and regulatory bodies; analyze and comment on major legislation affecting rail transportation; participate with the Department of Justice in major tax litigation matters under section 306 of the Railroad Revitalization and Regulatory Reform Act of 1976; administer settlements of safety violations; litigate NECIP contract claims; provide legal advice on Union Station contracts and high speed rail and intermodal grants; coordinate and supervise legal matters regarding the Conrail sale, the Alaska Railroad transfer, EPA-PCB matters, debt collection and real estate conveyance.

The Administration part of the program provides management system support in the areas of organization and manpower, including management procedures and duties, paperwork directives and reports management, ADP management, and information management. This activity also provides personnel support necessary to accomplish FRA program goals and objectives by recruiting and training qualified personnel; procurement support; and financial assistance and administrative support to all elements of FRA.

b. Office of Policy

Policy Support provides for the development of policies designed to promote the railroad mode within the private transportation sector. Funding for the Office of Policy supports, in part, the development of FRA positions for participation in the Interstate Commerce Commission (ICC) proceedings and legislative initiatives; provides for continuous evaluation of the railroad industry at the corporate level determining its health in terms of possible structural changes requiring Federal response; develops large scale computerized railroad related data banks for quantitative analysis in support of the formulation of FRA policies, and monitors Conrail sale covenants.

c. Passenger and Freight Services

This program funds the managers and analysts assigned to the Freight Assistance Programs, Passenger Service Programs, the Community and Shipper Assistance Staff, and the immediate staff of the Associate Administrator for Passenger and Freight Services. The Freight Services staff manages the funding and technical oversight of ongoing construction under approved loan and grant agreements; maintains financial and technical monitoring of agreements in force; maintains oversight over outstanding investments; and provides financial support and coordination for the continuing loan asset sale activities. Passenger Service activities support the administration of Amtrak grants, preparation of Amtrak budget recommendations, oversight of Amtrak's capital program, efforts to reduce Federal subsidies to Amtrak, oversight of remaining FRA responsibilities under NECIP, and analysis and coordination activities related to the Department's involvement in high-speed rail.

Resources

The following table compares FY 1990 funding for salaries and expenses with that requested for FY 1991.

SALARIES AND EXPENSES
(Dollars in thousands)

		FY 1991 Estimate		
	FY 1990	Adjustments to Base	Program Changes	Total Request
Budget Authority	$13,164	+$ 755	+$144	$14,063
Permanent Positions. . . .	196	...	-4	192

EXPLANATION OF CHANGES:

a. Adjustments to Base. . . . .+755

- Comparability Pay Adjustments. . . . .+686

  Provides increased costs of the January 1990 pay increase (3.6 percent) for a full year in FY 1991 and 3/4 of the 50 percent of the January 1991 (3.5 percent) pay increase not absorbed, for FRA employees as well as other Federal agency employees providing contract and reimbursable services to FRA.

- Within-Grade and Merit Pay Increases. . . . .+208

  This increase is to cover the additional costs of salaries and benefits due to within-grade and merit pay increases and performance-based awards.

- FICA and Medicare Payments. . . . .+36

  Increased costs of employer contributions for FICA and Medicare benefits due to scheduled adjustment in the maximum salary subject to such taxes.

- Compensable Day. . . . . +38

  An increase of $38,000 is necessary to cover the costs associated with an additional compensable day in FY 1991.

- Health Insurance Premiums . . . . +117

  FRA's contributions for health insurance coverage of employees are estimated to increase by $117,000 in FY 1991, based on the annual health insurance increase (30 percent) effective in January 1989.

o Federal Employees' Compensation Fund. . . . . +3

FRA's reimbursement to the Department of Labor (DOL) for billings of actual payments made to FRA employees for workmens' compensation increased by $3,000. The FY 1991 total is $39,868.

o Working Capital Fund . . . . -357

During FY 1990, an evaluation was made of the DOT Working Capital Fund charges and a reestimation of these changes produced a savings of $357,000. The FY 1991 total is estimated to be $1,019,000.

o Travel . . . . +10

During FY 1991, travel and related expenses are expected to increase by $10,000. The additional funding is needed to cover the per diem and mileage rate increases and telephone allowances that were effective in October 1988.

o Common Services Costs. . . . . +14

In FY 1991, the costs of common services, such as FAA payroll administration, U.S. postal services, USGC health facilities, FTS and local telephone services, and GSA store supplies, are estimated to increase by $14,000 (4 percent).

b. Program Changes. . . . .+144

o Non-Recurring Equipment Purchases . . . .-72

During FY 1990, FRA purchased office automation equipment to replace systems that were outdated and expensive to maintain and operate. With the exception of the office automation equipment purchases explained in this section, no additional equipment acquisitions are planned in this account in FY 1991.

o Position Reductions. . . . .

FRA requests the reduction of four authorized positions that have remained unfunded in recent fiscal years due to the expiration and phased termination of such financial assistance programs as the Section 505 Redeemable Preference Shares, Local Rail Service Assistance, and Northeast Corridor Improvement Program. Since these positions have been vacant, there are no cost-savings associated with the reduction.

o Office Automation Equipment Purchases. . . . . +98

During 1986, FRA completed a comprehensive review of its office automation capabilities, replacement needs, and evolving requirements. As a result, a five-year acquisition plan was initiated for the procurement of essential system components. The FY 1991 funding request reflects $33,000 in planned purchases of three microcomputer workstations, peripheral equipment to enhance storage capacity and operations, and the replacement of several outmoded printers that are costly to maintain. An additional $65,000 is requested to transfer Chief Counsel's safety enforcement and civil penalty information from timesharing operations to a microcomputer system.

o Office Automation Support Services . . . . +23

In support of ongoing office modernization, $174,200 in contractual services are needed for computer maintenance, training, software upgrades and other supplies. The FY 1991 estimate reflects an increase of $23,000 over FY 1990 costs.

o Reimbursable Services. . . . . +59

Computer timesharing expenses are estimated to total $129,400 for the FRA accounting system. Other reimbursable services include $86,000 for the DOT Drug Testing Program, DOL Employee Counseling Services Program, and DOT Honors Attorney Program. The FY 1991 total of $215,400 for reimbursable services is an increase of $59,400 above the FY 1990 expenses.

o Other Contract Services. . . . . +36

Technical assistance and advisory services are estimated to total $168,000, an increase of $36,000 in contractual services from FY 1990. The Immediate Office of the Administrator requires $9,000 in technical support for the automated correspondence control system. The Office of Budget requires $30,000 to implement an automated budget formulation system. Administration needs $123,000 for completing an automated contract drafting and information system, conducting information and automated systems reviews, and converting FRA's accounting system to the DOT's DAFIS standards. The Offices of Policy and Passenger and Freight Services require $6,000 for technical support of their shared local area network.

2. **CONTRACT SUPPORT**....................................$1,000

SUMMARY TABLE
(Dollars in thousands)

		FY 1991 Estimate		
	FY 1990	Adjustments to Base	Program Changes	Total Request
Program Level:				
a. Economic Analysis	$285	$...	+$ ...	$285
b. Industry Analysis	270	...	...	270
c. Systems Analysis	370	...	...	370
d. Freight Services Technical Assistance	...	...	+ 75	75
Total program level	**$925**	**$...**	**+$ 75**	**$1,000**

a. ECONOMIC ANALYSIS....................................$285

Background

The Economic Analysis program supports the development of FRA policy positions regarding participation in Interstate Commerce Commission (ICC) proceedings and legislative initiatives. Areas of concern include railroad rate regulation, ICC exemptions from regulation, effects of regulatory and legislative changes on competition between railroads and other modes of transport, rail mergers, and rail acquisitions of non-rail modes. As described below, these functions cover a wide range of policy questions, and contract resources will be concentrated on implementation of the DOT's emerging National Transportation Policy and related issues which could have the greatest impact on the railroad industry and its shippers.

Program Structure and Objectives

Within the Economic Analysis program, regulatory analysis provides economic research on the effects of actual and proposed regulatory changes on the railroad industry. The program's multimodal/intermodal analysis provides support for policy recommendations on regulatory and legislative multimodal and intermodal national transportation issues. Forecasting and model development, employing computer-based data banks of a national economic forecasting firm (jointly funded by FRA, FHWA and MARAD), provide necessary analytical tools for conducting in-house analyses. One use of those tools is in our railroad strike impact analyses, which are used by the National Mediation Board to determine whether or not a rail strike would result in a substantial economic impact.

Resources

The following table compares FY 1990 Economic Analysis funding with that requested for FY 1991:

ECONOMIC ANALYSIS
(Dollars in thousands)

		FY 1991 Estimate		
	FY 1990	Adjustments to Base	Program Changes	Total Request
TOTAL	$285	$ ...	$...	$285

b. INDUSTRY ANALYSIS..$270

Background

The Industry Analysis program provides the Office of the Administrator with primary analytical information covering the railroad industry's financial and operating condition, and labor management structure and human resource policy alternatives. These evaluations and special studies include the continuous development of financial, operating and traffic information from the reports of rail carriers and the analysis of asset and manpower productivity, operating efficiency, financial viability, economic performance and labor/management issues at the corporate and industry levels. The results are an invaluable source to FRA Policy, Chief Counsel, and Rail Safety staffs for their use in program evaluation, the identification of policy initiatives, and the development of special projects. The Industry Analysis program also serves as FRA's primary focal point for voluntary initiatives and policy evaluations dealing with industry human resource issues with particular emphasis on alcohol and drug prevention.

Program Structure and Objectives

The Industry Analysis program is comprised of two major activities which support the development of FRA policy:

(1) Industry Finance and Operations - Provides the analytical and oversight capability for a broad range of industry and carrier-related financial and operating issues including structural and traffic analyses, comparative analyses of selected railroads, financial monitoring of the industry, policy evaluations, special studies and support with heavy emphasis on merger impact analysis, financial viability assessments, tax and accounting changes, revenue determinations, cost and productivity trends, and profitability projections.

(2) Labor/Human Resource Policy - Provides resources to develop and implement programs to analyze policy options regarding rail labor issues, monitor developments in the labor/management negotiations, track and prepare impact assessments of labor strikes and disputes, provide FRA expertise in the area of labor protection, promote the voluntary adoption of an effective alcohol and drug prevention and rehabilitation response, and assist in the development and identification of work practices to enhance employee safety.

Resources

The following table compares FY 1990 Industry Analysis funding with that requested for FY 1991.

INDUSTRY ANALYSIS
(Dollars in thousands)

	FY 1990	FY 1991 Estimate Adjustments to Base	 Program Changes	 Total Request
(1) Industry Finance and Operations	$150	$...	$...	$150
(2) Labor/Human Resource Policy	120	...	...	120
Total	**$270**	**$...**	**$...**	**270**

c. SYSTEMS ANALYSIS.................................$370

Background

This program provides for the maintenance, update, and further development of large scale computerized railroad-related data banks and rail network models. It also provides for miscellaneous rail traffic and rail network evaluations, analyses and studies in support of the formulation of FRA policies.

Program Structure and Objectives

Within the Systems Analysis program, waybill statistics and rail network analysis provide for the upkeep of up-to-date traffic data bases and of the FRA Network Model. FRA has an on going agreement with the ICC to pay 50 percent of the waybill collection and processing costs. The FRA Network includes the defense essential network, rail traffic density distribution and a traffic flow simulation. Analytical and quantitative support provides for traffic and network analysis and for the development of selective traffic and operational data bases in support of special evaluations and studies throughout the FRA.

Resources

The following table compares FY 1990 Systems Analysis funding with that requested for FY 1991:

SYSTEMS ANALYSIS
(Dollars in thousands)

		FY 1991 Estimate		
	FY 1990	Adjustments to Base	Program Changes	Total Request
Waybill Statistics and FRA Network	$370	$...	$...	$370

d. FREIGHT SERVICES TECHNICAL ASSISTANCE TO REGIONAL AND SHORTLINE RAILROADS $75

Background

During the 1980's, Class I railroads have spun off thousands of miles of railroads. In so doing, Class I railroads are more profitable, and approximately 190 new regional and shortline railroads have been created. When added to the 285 railroads in operation before 1980, the result is that there now are approximately 475 railroads operating about 30,000 track miles, approaching the size of the Interstate Highway System. These railroads act as a feeder system for the Class I railroads and handle one-third of all rail freight carloads.

Public support for deregulation and downsizing by Class I railroads is influenced by the quality of service provided by the new railroads, especially to small cities and towns. The stronger and safer we can make these new railroads, the stronger will be public support for continuing deregulation and downsizing.

A technical assistance effort for regional and shortline railroads is essential to help these newly created railroads be profitable and to minimize the need for additional Federal investment for rehabilitation. The technical assistance will complement the Department's rail deregulation policy by stimulating efforts by newly created carriers and their emerging national associations to improve the safety and efficiency of their operations. This effort is necessary because regional and shortline railroads have limited resources for such purposes and, as a result, the private sector has not viewed technical assistance for these railroads as a business opportunity.

Resources

The following table compares FY 1990 funding with that requested for FY 1991:

FREIGHT SERVICES TECHNICAL ASSISTANCE TO REGIONAL AND SHORTLINE RAILROADS
(Dollars in Thousands)

		FY 1991 Estimate		
	FY 1990	Adjustments To Base	Program Changes	Total Request
Technical Assistance	$ ...	$ ...	+$75	$75

EXPLANATION OF CHANGE:

Program Change . . . . +$75

The additional funding will enable FRA to participate in the creation and distribution of technical, operating, and management aids which can play a significant role in the development and maturation of the regional and shortline railroad industry. In cooperation with and cost-sharing with State and industry associations, colleges and universities, and shipper groups, FRA would undertake needed technical assistance and participate in industry conferences on issues critical to the success of the regional and small railroad industry. The contractual activities would include: (1) analyses of accident and casualty rates and development of a safety education program, (2) preparation and dissemination of materials on alcohol and drug detection and prevention, and (3) the development of planning tools for track and equipment maintenance. FRA would also serve as a clearinghouse of information regarding regional and shortline railroads and State programs.

3. ALASKA RAILROAD WORKERS' COMPENSATION. $744

Background

This program provides reimbursement to the Department of Labor (DOL) for the annual workers' compensation payments paid to former employees of the Alaska Railroad who were on the rolls during the period of Federal ownership and to fund one-time lump sum payments made during the billing period to those former employees who qualify for such payments. Article V of the Alaska Railroad Transfer Agreement specifically provided that the Department of Transportation (DOT) would assume responsibility for all pre-transfer workmen's compensation claims. Under Title 5, U.S.C. Section 8147(b), DOT is required to request an appropriation to reimburse DOL for payments made to Federal employees from the Employees' Compensation Fund. Since the residual in the Alaska Railroad Revolving Fund is insufficient to pay current and future liabilities, an annual appropriation will continue to be necessary until such time as all former employees are removed from the compensation rolls.

Resources

The following table compares FY 1990 funding with that requested for FY 1991:

ALASKA RAILROAD WORKERS' COMPENSATION
(Dollars in thousands)

		FY 1991 Estimate		
	FY 1990	Adjustments to Base	Program Changes	Total Request
Program Level	$ ...	$ ...	+$ 744	$744

EXPLANATION OF CHANGE:

Program Change. . . . .+$744

This request reflects the reimbursement of $743,714 due to the DOL for actual compensation payments made during the billing period of July 1, 1988 to June 30, 1989.

RAILROAD SAFETY

For necessary expenses in connection with railroad safety, not otherwise provided for, [$31,900,000] $36,500,000, of which [$1,175,000] $1,203,000 shall remain available until expended: **Provided**, That there may be credited to this appropriation funds received from non-Federal sources for expenses incurred in training safety employees of private industry, State and local authorities or other public authorities. (Department of Transportation and Related Agencies Appropriations Act, 1990; additional authorizing legislation to be proposed.)

STANDARD FORM 300

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
RAILROAD SAFETY

Program and Financing (in thousands of dollars)

69-0702-0-1-401	19 89	19 90	19 91
Program by activities:			
Direct program:			
00.01 Federal enforcement......	21,107	24,462	28,895
00.02 Automated track inspection program...........	1,444	1,313	1,203
00.03 Safety regulation and program administration.	5,546	5,970	6,402
00.91 Total direct program...	28,097	31,745	36,500
01.01 Reimbursable program.....	250	1,000	750
10.00 Total obligations......	28,347	32,745	37,250
Financing:			
11.00 Offsetting collections from Federal funds.....	-250	-1,000	-250
14.00 Offsetting collections from non-Federal sources..............	...	...	-500
17.00 Recovery of prior year obligations............	-72	...	...
21.40 Unobligated balance available, start of year................	-481	-250	...
24.40 Unobligated balance available, end of year.	250	...	...
25.00 Unobligated balance lapsing................	32	...	...
39.00 Budget authority.....	27,825	31,495	36,500
Budget authority:			
40.00 Appropriation............	27,825	31,900	36,500
40.00 Reduction pursuant to P.L. 99-177.............	...	-405	...
43.00 Appropriation (adjusted)..........	27,825	31,495	36,500
Relation of obligations to outlays:			
71.00 Obligations incurred, net....................	28,097	31,745	36,500

STANDARD FORM 300

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
RAILROAD SAFETY

Program and Financing (in thousands of dollars)

Identification code 69-0702-0-1-401	19 89	19 90	19 91
72.40 Obligated balance, start of year................	4,423	4,386	7,227
74.40 Obligated balance, end of year................	-4,386	-7,227	-7,300
77.00 Adjustments in expired accounts..............	-102	...	...
78.00 Adjustments in unexpired accounts..............	-72	...	...
90.00 Outlays...............	27,960	28,904	36,427

RAILROAD SAFETY

PROGRAM AND PERFORMANCE

The 1991 budget includes funds for an additional 47 staff years, including 12 trainees to enhance the management and enforcement of new regulations mandated by the Rail Safety Improvement Act of 1988. Beginning in 1991, the Department is proposing to establish a user fee for the railroad safety program.

Federal enforcement. - This program provides salaries and related expenses for safety field operations and is designed to reduce the number of railroad related accidents/incidents. Federal inspectors monitor railroads for compliance with Federal laws with specific emphasis on passenger and hazardous material routes. In addition, this staff provides training to Federal, State and railroad industry personnel on related safety enforcement activities, including programs dealing with the problem of alcohol and drug abuse.

Automated track inspection program. - This program provides funds for the continued operation by FRA's Office of Safety of a self-propelled automatic track inspection vehicle. The track inspection vehicle will survey approximately 28,000 miles of track in 1991.

Safety regulation and program administration. - This program funds the salaries and related expenses of safety headquarters personnel, data gathering and dissemination, and planning and evaluation activities; issues new or revised standards, procedures, and regulations to provide a safer railroad environment; and administers post-accident and random testing of railroad employees, technical training and management of rail-highway grade crossings.

STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
RAILROAD SAFETY

OBJECT CLASSIFICATION (in thousands of dollars)

Identification code 69-0702-0-1-401		19 89	19 90	19 91
	Direct obligations:			
	Personnel compensation:			
11.1	Full-time permanent.......	16,100	18,782	21,033
11.3	Other than full-time permanent................	98	102	106
11.5	Other personnel compensation............	324	336	349
11.9	Total personnel compensation...........	16,522	19,220	21,488
12.1	Civilian personnel benefits.................	2,786	3,234	4,029
13.0	Benefits for former personnel................	184	212	286
21.0	Travel and transportation of persons...............	2,508	3,219	4,006
22.0	Transportation of things..	77	72	72
23.1	Rental payments to GSA....	1,176	1,278	1,504
23.2	Rental payments to others.	40	36	36
23.3	Communications, utilities, and miscellaneous charges	681	872	1,111
24.0	Printing and reproduction.	187	168	146
25.0	Other services...........	3,542	3,359	3,340
26.0	Supplies and materials....	156	61	116
31.0	Equipment.................	238	14	366
99.0	Subtotal direct obligations.............	28,097	31,745	36,500
99.0	Reimbursable obligations..	250	1,000	750
99.9	Total obligations........	28,347	32,745	37,250

STANDARD FORM 300

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
RAILROAD SAFETY

Personnel Summary

69-0702-0-1-401	89	90	91
Total number of full-time permanent positions...........	446	486	498
Total compensable workyears:			
Full-time equivalent employment...............	399	434	481
Full-time equivalent of overtime and holiday hours..................	4	7	7
Average SES salary...........	$74,100	$79,230	$93,730
Average GS grade.............	11.5	11.6	11.6
Average GS salary............	$39,522	$43,260	$43,600

FEDERAL RAILROAD ADMINISTRATION
RAILROAD SAFETY

SUMMARY STATEMENT

The Federal role in the Railroad Safety program is to protect railroad employees and the public by ensuring the safe operation of passenger and freight trains. The authority to accomplish this role is found in the Federal Railroad Safety Act of 1970 (as amended), the Department of Transportation Act, and the Hazardous Materials Transportation Act.

The mission of the Office of Safety is to develop, administer, and enforce effective programs to achieve safe operating and mechanical practices in the railroad industry. The Office of Safety, through its regional offices, is responsible for the enforcement of Federal railroad safety regulations and standards.

The Office of Research and Development provides the research, development, and demonstration of all aspects of railroad safety research and intercity ground transportation in order to improve safety and stimulate beneficial advances in railroad technology. The Office of Research and Development is funded through a separate appropriation as discussed in the next section.

Objectives

- Improve safety in the transport of hazardous materials, in passenger train operations, and at rail-highway crossings.
- Reduce railroad employee casualties.
- Reduce the number of railroad trespasser fatalities.
- Reduce overall rail accident frequency.
- Foster cooperation between the Government and labor and industry.
- Review, update or eliminate standards, procedures, and regulations in order to minimize the burden on railroads.

Accomplishments

The following major accomplishments were achieved during FY 1989:

- Assisted FHWA in preparation of a National Needs study regarding rail-highway crossings. The study was mandated by Congress and addresses safety, economic, maintenance, community, and human factors issues.

- Completed a contract with the Texas Transportation Institute (of Texas A&M University) to study the Texas 800 Number call-in system whereby motorists are provided a toll free number to report observed rail-highway crossing problems to the state Department of Public Safety.

- Integrated three monitoring programs that cover inspector performance and costs, where inspection forces are needed, and forecast where inspectors will be inspecting and the type of inspections planned. This method of measuring risk and allocation of FRA's limited resources, to best address the safety of the industry, is more manageable and cost effective than the Risk Assessment and Control Program that was under development in the past.

- Operated the Automated Track Geometry inspection vehicle T-10, over 32,035 miles of main track.

- Handled approximately 700 complaints received from railroad employees, private citizens, and public officials.

- Completed follow-up activities on the Guilford and Conrail assessments.

- Conducted comprehensive monitoring of numerous train movements of spent nuclear fuel being shipped by the Department of Energy from the Three Mile Island facility in Middletown, Pennsylvania, to Scoville, Idaho and by the Nuclear Regulatory Commission from Cooper Station, Nebraska, to E. Morris, Illinois.

- Commenced a study of the advisability and feasibility of requiring automatic train control systems on each rail corridor where passengers or hazardous materials are carried. A public meeting has been held seeking consultation with Amtrak, freight carriers, commuter agencies, employee representatives, railroad passengers, and rail equipment manufacturers. The study will examine the costs of installing automatic train control; the hazards of not requiring the installation of automatic train control; and alternative systems using advanced technology such as transponders or satellite systems.

- Processed 96 applications from carriers seeking FRA approval to materially modify or discontinue signal and train control systems, and six petitions seeking relief from the requirements of the Rules, Standards and Instructions governing the installation, maintenance, and testing of signal and train control systems. Because of the complexity and public interest shown, public hearings were held in ten locations.

- The FRA's regulation on the control of alcohol and drug use in railroad operations completed its third year of being in effect. The post-accident testing data indicated that alcohol or drug using employees were involved in major accidents and that the rate of positives was about six percent. FRA concluded that additional measures were needed and, following a series of hearings, established a requirement that railroads randomly test their employees who are subject to the Hours of Service Act. The rate of testing is to be 25 percent the first year and 50 percent in each year thereafter.

- Issued a final rule revising the schedule of civil penalties to reflect the higher penalty amounts found under the amended rail safety statutes. This document also contained a general statement of policy explaining the agency's civil penalty process and the agency's policy on exercising it expanded enforcement authority over individuals.

- Issued a final rule prohibiting tampering with safety devices. This amended existing rules concerning railroad operating practices to prohibit tampering with safety devices and operational monitoring devices installed on locomotives. The amendments also made it unlawful to operate any train on which safety devices have been unlawfully disabled.

- Issued a final rule requiring that whoever performs a departure test of an automatic cab signal, train stop, or train control system shall certify in writing that the test was properly made. The certification and the test results are required to be posted in the cab of the locomotive and a copy left at the test location.

- Amended orders to a final rule previously issued requiring automatic train control on the Northeast Corridor between Washington, D.C., and Boston, Massachusetts, to also include the connection lines between Philadelphia, Pennsylvania, and Atlantic City, New Jersey; Philadelphia and Harrisburg, Pennsylvania; New York City and Albany, New York; and New Haven, Connecticut, and Springfield, Massachusetts.

- Issued an Advance Notice of Proposed Rulemaking related to Grade Crossing Signal System Safety. A two-day oral hearing was held and analysis of the testimony and documentation are being conducted.

- Issued a final rule amending regulations concerning Railroad Safety Enforcement Procedures (effective 11/17/89). This rule prescribed procedures for disqualifying railroad employees from performing safety-sensitive functions in the rail industry.

- Issued a final rule amending 49 CFR Part 218 - Railroad Operating Rules, by adding a Subpart E - Protection of Occupied Camp Cars. This action extends blue signal protection to on-track vehicles where rest is provided to employees.

- Issued an Advance Notice of Proposed Rulemaking to determine if Federal regulations are needed to require event recorders on trains. Statements given at the public hearing and written comments received are being reviewed.

- An Advance Notice of Proposed Rulemaking to establish minimum qualifications for locomotive operators was issued.

- Approximately 44 rule changes are under development between FRA and the Research and Special Programs Administration (RSPA). We have been exceptionally active in the RSPA rulemaking process--exclusively on rail related issues. The most important of these rule changes are:

  HM-197: FRA completed testing of various intermodal tanks. A Notice of Proposed Rulemaking was issued in 1989 covering the use of cargo (highway tanks) tanks, portable tanks in IM portable tanks, and multi-unit tank car tanks in TOFC/COFC service. Notice of Proposed Rulemaking to be published in the Spring of 1990.

  HM-201: FRA and RSPA reviewing comments on ANPRM covering the detection and repair of cracks, pits, corrosion, lining flaws and other defects of tank car tanks.

  HM-201B: RSPA/FRA are reviewing comments received from twelve petitioners for reconsideration of the final rule covering shippers' use of tank car tanks with localized thin spots. Final rule was extended until January 1, 1990. Final rule, corrections - published January 5, 1990.

- AAR is developing industry locomotive crashworthiness safety standards for FRA consideration, as a result of the recent Locomotive Cab Safety Inquiry involving Industry, Labor and Government.

- Conducted assessments on Montana Rail, Oklahoma, Kansas and Texas Southern Pacific Commuter Operation in San Francisco and CSX Detroit Division.

- Processed 134 exemption and 10 emergency exemption applications for relief from the Hazardous Regulations, for rail transportation.

- Issued 91 approval letters to transport intermodal containers of hazardous materials in Trailer-On-Flat-Car (TOFC) or Container-On-Flat-Car (COFC) service.

- Drafted an Advance Notice of Proposed Rulemaking pertaining to the train placement of hazardous materials at the rear of a cabooseless train, including documentation requirements at both ends of a train transporting hazardous materials.
- Drafted new retest requirements (safety valve and tank test) for tank cars (49 CFR 173.31(c)).
- Drafted a complete rewrite of 49 CFR Park 174 - Rail Carriage of Hazardous Materials.
- Finalized the Tank Car Report with the Research and Special Programs Administration (RSPA). In addition, a joint letter signed by both Administrators (FRA and RSPA) was delivered to Senator Lautenberg and Congressman Lehman advising Congress of the completed report and plan adopted by FRA and RSPA to ensure the continued safety transportation of hazardous materials by railroads.
- HM-181 and 181B: Assisted RSPA in preparing a Final Rule to align the hazardous materials regulations with the United Nations Committee of Experts' Recommendations on the Transport of Dangerous Goods and the Technical Instructions for the Safety Transport of Dangerous Goods by Air of the International Civil Aviation Organization.

FEDERAL RAILROAD ADMINISTRATION

RAILROAD SAFETY
(Dollars in thousands)

SUMMARY TABLE

	FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
Budget Authority...... (Program Level)	**$31,495**	**$36,500**	**+$5,005**

ADJUSTMENTS TO BASE AND PROGRAM CHANGES

	Program Level	Authorized Positions	FTEs
FY 1990 Base........................	$31,495	486	434
Adjustments to Base:			
o Annualization of FTEs.........	+1,381	...	+24
o Comparability pay adjustments.	+1,213	...	...
o Within-grade, and merit pay increases....................	+136	...	...
o FICA and Medicare payments....	+78	...	...
o Health insurance premiums.....	+218	...	...
o Compensable Day...............	+80	...	...
o Federal Employees' Compensation Fund........................	+74	...	...
o Travel........................	+362	...	...
o Rental payments to GSA........	+162	...	...
o Working capital fund..........	-177	...	...
o Common services costs.........	+105	...	...
o Terminal leave payments.......	-98	...	...
Subtotal, Adjustments to Base......	+3,534	...	+24
Program Changes:			
o Additional staffing requirements................	+1,205	+12	+23
o Office automation equipment purchases..................	+234	...	...
o Office automation support service.....................	+39	...	...

	Program Level	Authorized Positions	FTEs
o Data Management	-150	...	...
o Toxicological Testing	+600	...	...
o Planning and Evaluation	-500	...	...
o Automated Track Inspection Program	+43	...	...
Subtotal, Program Changes	+1,471	+12	+23
Subtotal, Increases or Decreases	+5,005	+12	+47
Total Program Level	**$36,500**	**498**	**481**

FULL TIME EQUIVALENTS

The following table shows FY 1990 and FY 1991 projected full-time equivalents (FTEs) by position for field and headquarters:

		FY 1991 Estimate		
	FY 1990	Adjustments to Base	Program Changes	Total Request
Region and Field Offices:				
Regional Directors and Safety Supervisors....	57	...	...	57
Safety Inspectors.......	273	+15	+4	292
Trainees................	...	...	+12	12
Clerical................	47	+2	+7	56
Subtotal.............	377	+17	+23	417
Headquarters:				
Professionals...........	47	+7	...	54
Clericals...............	10	...	...	10
Subtotal.............	57	+7	...	64
TOTAL................	434	+24	+23	481

FEDERAL RAILROAD ADMINISTRATION

RAILROAD SAFETY

SUMMARY TABLE
(Dollars in thousands)

Program by Activities	FY 1990	FY 1991 Estimate Adjustments to Base	Program Changes	Total Request
Program Level:				
1. Federal Enforcement..	$24,462	+$2,962	+$1,471	$28,895
2. Automated Track Inspection Program..	1,160	...	+43	1,203
3. Safety Regulation and Program Administration......	5,873	+572	-43	6,402
Total....................	**$31,495**	**+$3,534**	**+$1,471**	**$36,500**

1. FEDERAL ENFORCEMENT..$28,895

Background

Federal enforcement of regulations and standards is accomplished through a force of Federal inspectors located in eight regional offices consisting of 47 district/field offices throughout the United States.

Regional Directors of Railroad Safety develop and administer regional safety programs, consistent with national policies, and ensure carrier compliance with Federal safety laws, regulations, and standards pertaining to railroad safety.

Railroad Safety Inspectors investigate and inspect rail carriers' property to determine compliance with existing Federal rail safety laws. These inspectors also conduct accident investigations to determine the accident cause, undertake special safety assessments, and investigate violations and complaints related to railroad safety. The FRA inspector disciplines are Track, Operating Practices, Signal and Train Control, Hazardous Materials, and Motive Power and Equipment.

A field staff of 373 professional and 58 clerical support positions is requested to enhance the enforcement of regulations mandated by the Rail Safety Improvement Act of 1988.

Resources

The following table compares FY 1990 funding with that requested for FY 1991:

	FY 1990	FY 1991 Estimate Adjustments to Base	FY 1991 Estimate Program Changes	FY 1991 Estimate Total Request
Program Level....	**$24,462**	**+$2,962**	**+$1,471**	**$28,895**
Permanent Positions:				
Professional....	361	...	+12	373
Clerical........	58	...	...	58
Total Positions.	**419**	**...**	**+12**	**431**

EXPLANATION OF CHANGES:

Adjustments to Base......................................+$2,962

- Annualization of FTEs....................................+978

  An additional $978,000 is required to cover the full annual salaries, benefits and related expenses of the 17 FTEs remaining from the 38 new positions (21 FTEs) authorized in FY 1990.

- Comparability Pay Adjustment.............................+960

  Increased costs of $665,000 for the January 1990 pay increase (3.6 percent) for a full year in FY 1991 and $295,000 for 3/4 of the 50 percent not absorbed of the January 1991 (3.5 percent) pay increase, for FRA employees as well as other Federal agency employees providing contract and reimbursable service to FRA.

- Within-Grade and Merit Pay Increases......................+111

  This increase is necessary to cover the additional costs of salaries and benefits due to within-grade and merit pay increases and performance-based awards.

- FICA and Medicare Payments................................+75

  Increased costs of employer contributions for FICA and Medicare benefits due to scheduled adjustment in the maximum salary subject to such taxes.

- Health Insurance Premiums.................................+189

  FRA's contributions for health insurance coverage of employees are estimated to increase by $189,000 in FY 1991, based on the annual rate increase (20 percent) effective in January 1989.

- Compensable Day...+68

  An increase of $68,000 is necessary to cover the costs associated with an additional compensable day in FY 1991.

- Federal Employees' Compensation Fund.......................+74

  FRA's reimbursement to the Department of Labor (DOL) for payments for injuries to FRA employees is expected to increase by $73,827 for a total cost of $289,849 in FY 1991.

- Terminal Leave Payments....................................-98

  A reduction of $98,000 is anticipated in the costs for terminal leave payments associated with fewer estimated retirements of FRA field employees.

- Travel...+352

  During FY 1991, travel and related expenses are expected to increase an additional $352,000. The additional funding is needed to cover the per diem and mileage rate increases and telephone allowances that were effective in October 1988. The FY 1991 total estimate will provide sufficient funding to permit the inspectors in the FY 1990 base to travel at least 15 days per month as mandated by Congress.

- Rental Payments to GSA.....................................+162

  In FY 1991 it is estimated that General Services Administration charges for field office space will increase by $162,000 to a total of $1,024,000. This total excludes the $416,000 for headquarters.

- Common Service Costs.......................................+91

  In FY 1991, the costs of common services, such as FAA payroll administration, U.S. postal services, USCG health facilities, FTS and local telephone service and GSA store supplies, are estimated to increase by $91,000.

Program Changes..$1,471

- Additional Positions.......................................+$1,205

  The Rail Safety Improvement Act of 1988 (RSIA) expanded FRA's safety authority, regulation, and enforcement responsibilities over railroad employees, equipment, and operations. FRA requested an increase of 34 inspectors and four clerical support positions in FY 1990 to begin to implement RSIA.

  We are requesting an increase of $593,000 to fully fund the salaries and expenses for 11 FTEs unfunded from FY 1990 vacant positions. This amount has been partially offset by savings from filling positions at a lower step. In addition, we are requesting an additional 12 trainee positions and FTEs for FY 1991. One of the goals of the inspector trainee program is to bring to the inspector workforce fresh talent recruited from colleges and universities, who can be expected to remain with FRA for many years. These recruits will come on board at the lower grade levels, probably GS-5 or 7, and will be trained to meet the specific needs of the FRA and in the latest technological advancements of the rail industry. Before reaching the target position of Railroad Safety Inspector at the GS-12 grade level, the trainees will undergo a training program which will include on-the-job assignments, formal classroom instructions and rotational assignments through the inspector disciplines. During the recruitment process, special emphasis will be placed on recruiting minorities and females into the program.

o Office Automation Support Services......................+32

In support of office automation improvements, an additional $32,000 is needed for computer maintenance, training, software upgrades, and other supplies.

o Office Automation Equipment Purchases..................+234

During FY 1989, FRA expects to complete field testing of portable microcomputers used by field safety inspectors for efficient reporting and processing of inspection reports. The FY 1991 request provides an additional $234,000 to provide 80 inspectors with portable computers.

2. AUTOMATED TRACK INSPECTION PROGRAM (ATIP)...............$1,203

Background

The ATIP budget for FY 1990 allowed $1,160,000 to support a level of effort of 28,500 miles of track survey by FRA's self-propelled measurement vehicle T-10. Operational costs included contractor charges and fees for vehicle operation and maintenance and T-10 data collection and distribution, as well as reimbursement to the railroads for out-of-pocket costs including train crews, railroad supervision, diesel fuel, terminal and shop support at Metro-North, Harmon, New York shops for Federally mandated biannual maintenance (49 CFR 229, Sections 229.27, 229.29 and 229.31) and, where necessary, locomotive rental. A contract was awarded to Ensco, Inc. of Springfield, Virginia, under competitive bid April 28, 1989, for a 60-month period for $3,979,102. (An Independent Government Cost Estimate had estimated the contract cost over a 60-month period at $6,109,180).

Resources

The following table compares FY 1990 funding with that requested for FY 1991:

	FY 1990	FY 1991 Estimate Adjustments to Base	Program Changes	Total Request
Program Level....	$1,160	$...	+$43	$1,203

EXPLANATION OF CHANGES:

Program Change..+$43

The contract cost estimate to complete 12 months of survey and schedule maintenance and supplies fully loaded with overhead, administrative cost and fee is $806,000. Railroad operating and service costs, fuel and supplies are estimated at $180,000. FRA plans to replace the existing two eleven year old Hewlett Packard processors with a new Hewlett Packard A900 series processor. It is estimated that this cost fully loaded will be $155,000. It is anticipated that in FY 1991, in addition to the annual inspection and maintenance, it will be necessary to overhaul the auxiliary power supply, the air compressor and both automatic transmissions at an estimated cost of $62,000.

3. SAFETY REGULATION AND PROGRAM ADMINISTRATION............$6,402

Background

This program funds the salaries and related expenses of the Immediate Office of the Associate Administrator, the Office of Safety Enforcement and the Office of Safety Analysis. In addition, the data management, toxicological testing, and planning and evaluation activities are funded under this program.

The Immediate Office of the Associate Administrator provides overall direction to FRA's safety enforcement, regulatory and data development programs. The office consists of the Associate Administrator for Safety, the Deputy Associate Administrator, and the Executive Assistant.

The Office of Safety Enforcement provides guidance on regulations to FRA regional and state safety offices and directs special assessments of railroad operations. This office also evaluates petitions requesting waivers from standards, rules and regulations; processes the handling of safety related complaints; and coordinates the training of FRA and state railroad safety personnel. In addition, this office also provides contractual assistance to support the FRA's alcohol and drug regulation.

The Office of Safety Analysis conducts benefit-cost analyses of potential regulatory changes; plans and directs the design and development of automated systems; and performs safety analysis of relevant railroad operating data. In addition, this office administers the railroad safety aspects of rail-highway crossing programs and assists state rail safety programs.

A headquarters staff of 55 professional and 12 clerical support positions is requested to continue the management and enforcement of safety regulations.

Program Structure and Objectives

Safety Regulation and Program Administration consists of four major activities.

a. Salaries and Expenses - Provides funds for the salaries and related expenses of personnel located in the headquarters Office of Railroad Safety.

b. Data Management - Provides the information base for the Office of Safety. The information is used in accident analysis, for railroad assessments, the National Inspection Plan, rail-highway warning allocation planning, and to monitor inspection activity.

c. Toxicological Testing - Provides funds to support the FRA's Alcohol and Drug Regulation. Planned activities include the following:

   o Post-accident testing of alcohol and drug use samples following significant accidents. This testing is required by FRA regulations.

   o Scientific and technical oversight of the testing laboratory and monitoring of the testing procedures.

   o Comprehensive review and oversight of the railroads' random testing plans and contractor assistance to evaluate the railroads' scientific program to accomplish the actual testing.

d. Planning and Evaluation - Provides studies and contractual services to support the Office of Safety's regulatory process. Planned activities include the following:

   o Accident analysis will be performed using the Train Operations Simulator (TOS) which simulates different scenarios of train speed, braking application and terrain characteristics.

   o Quick response studies will be conducted if potential problems arise with specific pieces of railroad equipment. Operational testing would be done as necessary.

Resources

The following table compares FY 1990 funding with that requested for FY 1991:

		FY 1991 Estimate		
	FY 1990	Adjustments to base	Program Changes	Total Request
Program Level:				
a. Salaries and Expenses...	$4,173	+$572	+$7	$4,752
b. Data Management.........	1,120	...	- 150	970
c. Toxicological Testing...	...	...	+ 600	600
d. Planning and Evaluation.	580	...	-500	80
TOTAL...............	$5,873	+$572	-$43	$6,402
Permanent Positions:				
Professional........	55	...	...	55
Clerical............	12	...	...	12
TOTAL...............	67	...	...	67

EXPLANATION OF CHANGES:

Adjustments to Base.....................................+$572

o Annualization of FTEs.....................................+403

An additional $403,000 is required to cover the full annual salaries, benefits and related expenses of the one FTE remaining from the two new positions (1 FTE) approved in FY 1990 and six unfunded positions from prior years.

o Comparability Pay Adjustment..............................+253

Increased costs of $173,000 for the January 1990 pay increase (3.6 percent) for a full year in FY 1991 and $80,000 for 3/4 of the 50 percent not absorbed of the January 1991 (3.5 percent) pay increase, for FRA employees as well as other Federal agency employees providing contract and reimbursable service to FRA..

o Within grade and merit pay increases.......................+25

This increase is necessary to cover the additional costs of salaries and benefits due to within-grade, merit pay increases and performance-based awards.

- FICA and Medicare Payments.................................+3

  Increased costs of employer contributions for FICA and Medicare benefits due to scheduled adjustment in the maximum salary subject to such taxes.

- Health Insurance Premiums.................................+29

  FRA's contributions for health insurance coverage of employees are estimated to increase by $29,000 in FY 1991, based on the annual rate increase (20 percent) effective in January 1989.

- Compensable Day.................................+12

  An increase of $12,000 is necessary to cover the costs associated with an additional compensable day in FY 1991.

- Travel.................................+10

  An additional $10,000 is needed to cover per diem and mileage rate increases and telephone allowances that were effective in October 1988.

- Working Capital Fund.................................-$177

  In FY 1991, it is anticipated that the DOT Working Capital Fund charges for telephone, library, health center, printing, building management, and other services provided by the Office of the Secretary will decrease by $177,000. The FY 1991 total is estimated to be $125,000 for headquarters, excluding the $212,000 for the field.

- Common Service Costs.................................+14

  In FY 1991, the costs of common services, such as FAA payroll administration, U.S. postal services, USCG health facilities, FTS and local telephone services, and GSA store supplies, are estimated to increase by $14,000.

Program Changes.................................-$43

(a) Salaries and Expenses:

- Office Automation Support Service.................................+$7

  In support of office automation improvements, an additional $7,000 is needed for computer maintenance, training, software upgrades, and other supplies.

(b) Data Management.................................-$150

This decrease in funding is due to non-recurring costs of developing new data bases and programs to support the new regulations.

(c) Toxicological Testing ....+$600

This activity reflects the separation of the costs which had previously been partially covered under the Planning and Evaluation Program to support the FRA's alcohol and drug regulation.

The FRA alcohol and drug control regulation that covers railroad employees requires the provision of blood and urine samples after major railroad accidents. The FRA must contract with a toxicological testing laboratory to have the samples tested and for an oversight contractor to ensure that practices at the testing laboratory are consistent with standards and produce valid test results. The FRA also requires contract assistance to review and implement provisions of the random testing regulation. Total funding is estimated at $600,000.

The post-accident testing contract will cost about $400,000 and provide for toxicological analysis of blood and urine samples following major railroad accidents. The contractor provides the facilities, personnel and material required to test samples from about 800 individuals per year. The contractor also provides expert technical advice concerning interpretation of test results and administrative service pertaining to files and reporting test results.

The oversight contractor provides a continuous evaluation of the testing being performed by the laboratory. This is accomplished through periodic inspection of the records, procedures and methods used by the testing laboratory. A comprehensive proficiency testing program, including both open and blind samples, is provided by this contract. Reports on the inspections and proficiency testing are provided to the FRA on a regular basis. This effort is essential to verify the integrity of the testing process. It is estimated to cost $150,000 in FY 1991.

FRA will be involved in the extensive review and oversight of random testing plans being utilized by the railroads in FY 1991. FRA does not have a statistical staff to address this technical area of the random testing process. Accordingly, it is anticipated that contractual assistance will be required at a cost of $50,000.

(d) Planning and Evaluation................................-$500

This decrease in funding reflects the separation of costs associated with the FRA's alcohol and drug regulation justified above under toxicological testing. The remaining FY 1991 funding request of $80,000 is necessary to provide for studies and contractual assistance to support the Office of Safety's regulatory process.

RAILROAD RESEARCH AND DEVELOPMENT

For necessary expenses for railroad research and development, [$9,600,000] $16,984,000, to remain available until expended. (Department of Transportation and Related Agencies Appropriations Act, 1990.)

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised
000-101

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
RAILROAD RESEARCH AND DEVELOPMENT

Program and Financing (in thousands of dollars)

Identification code 69-0745-0-1-401		19 89 actual	19 90 estimate	19 91 estimate
Program by activities:				
Direct program:				
00.01	Equipment, operations and hazardous materials....	2,660	4,091	3,024
00.02	Track safety.............	5,130	6,203	4,747
00.03	Magnetic levitation and high speed rail	...	...	6,150
00.04	Environmental law compliance (facilities)	...	...	1,500
00.05	Other....................	...	1,443	...
00.06	Administration...........	1,165	1,550	1,563
00.91	Total direct program...	8,955	13,287	16,984
01.01	Reimbursable program.....	7,967	20,450	8,300
10.00	Total obligations......	16,922	33,737	25,284
Financing:				
11.00	Offsetting collections from: Federal funds..........	-7,967	-20,450	-8,300
17.00	Recovery of prior year obligations...........	-531	...	...
21.40	Unobligated balance available, start of year................	-2,936	-3,798	...
24.40	Unobligated balance available, end of year.	3,798	...	...
39.00	Budget authority....	9,286	9,489	16,984
Budget authority:				
40.00	Appropriation...........	9,286	9,600	16,984
40.00	Reduction pursuant to P.L. 101-164..........	...	-29	...
40.00	Reduction pursuant to P.L. 99-177...........		-82	
43.00	Appropriation (adjusted)........	9,286	9,489	16,984
[illegible]		[illegible]	[illegible]	[illegible]

STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
RAILROAD RESEARACH AND DEVELOPMENT

Program and Financing (in thousands of dollars)

Identification code 69-0745-0-1-401	1989 actual	1990 estimate	1991 estimate
Relation of obligations to outlays:			
71.00 Obligations incurred, net....................	8,955	13,287	16,984
72.40 Obligated balance, start of year...............	10,604	12,009	10,118
74.40 Obligated balance, end of year...............	-12,009	-10,118	-11,852
78.00 Adjustments in unexpired accounts..............	-531	...	...
90.00 Outlays................	7,019	15,178	15,250

Note: -In 1990, the Office of the Administrator appropriation included $500 thousand for grants to evaluate high-speed rail projects and for FRA to assess the safety of magnetic levitation systems.

RAILROAD RESEARCH AND DEVELOPMENT

PROGRAM AND PERFORMANCE

The 1991 budget provides funds for the conduct of railroad research and development, including the salaries and related expenses of the research management staff. The research conducted encompasses all aspects of existing and anticipated railroad operations and maintenance relating to railroad safety and advanced technology.

Equipment, operations, and hazardous materials safety-This program focuses on the safety and performance of equipment, components, operating practices, and hazardous materials transport in the railroad environment.

Track safety.-This program focuses on the safety and performance of track structures including critical components, railroad bridge structures, signal and train control systems, and other elements of the railroad right of way that influence train operations. It also encompasses research on the interaction between trains and the track structure.

Magnetic levitation and high speed rail technology.-This program focuses on the safety and performance characteristics of very high speed rail and magnetic levitation (maglev) transportation systems. The 1991 research activities will pick up on earlier maglev research that was suspended in the mid-seventies by incorporating technological advances made worldwide since then. Emphasis will be on determination of the viability of "next generation" maglev systems and the potential for implementation of maglev systems by the U.S. private sector, given some stimulus from the Federal Government, and on the establishment of a sound technical basis for the development of the initial national safety standard for maglev transportation systems.

Environmental law compliance (facilities).-This program includes those activities necessary to bring Federal Railroad Administration research and development facilities into compliance with Federal and State environmental laws.

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
RAILROAD RESEARCH AND DEVELOPMENT

OBJECT CLASSIFICATION (in thousands of dollars)

Identification code 69-0745-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Direct obligations:			
Personnel compensation:			
11.1 Full-time permanent.......	758	840	960
11.5 Other personnel compensation............	9	20	20
11.9 Total personnel compensation...........	767	860	980
12.1 Civilian personnel benefits.................	118	100	120
13.0 Benefits for former personnel...............	1	1	1
21.0 Travel and transportation of persons...............	33	67	76
22.0 Transportation of things..	5	3	4
23.1 Rental payments to GSA....	76	82	87
23.3 Communications, utilities, and miscellaneous charges	24	60	40
24.0 Printing and reproduction.	15	20	20
25.0 Other services...........	7,838	12,030	15,586
26.0 Supplies and materials....	55	53	56
31.0 Equipment................	23	11	14
99.0 Subtotal direct obligations............	8,955	13,287	16,984
99.0 Reimbursable obligations..	7,967	20,450	8,300
99.9 Total obligations........	16,922	33,737	25,284

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
RAILROAD RESEARCH AND DEVELOPMENT

Personnel Summary

Identification code 69-0745-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Total number of full-time permanent positions...........	15	15	16
Total compensable workyears: Full-time equivalent employment...............	13	15	16
Average SES salary...........	$76,400	$78,500	$92,500
Average GS grade.............	12.9	13.2	13.2
Average GS salary............	$56,677	$58,200	$59,500
[illegible]	[illegible]	[illegible]	[illegible]

FEDERAL RAILROAD ADMINISTRATION

RAILROAD RESEARCH AND DEVELOPMENT

NARRATIVE JUSTIFICATION

The objective of the Railroad Research and Development (R&D) program is to provide science and technology support for rail safety rulemaking and enforcement and to stimulate beneficial technology advances in maglev and very high speed intercity ground guided transportation systems. The maglev activities are in response to FRA responsibility to assure the safety of such systems and opportunities for U.S. development of this technology which will have such a positive impact on congested transportation networks.

Safety

The research and development FY 1991 request for Safety supports research in response to known safety problems or requirements; however, experience has shown that unanticipated research requirements develop. These typically arise from unexplained accident causes, safety inspector field observations, events concerning new technological developments in industry equipment and plant, or in operating and maintenance practices that display symptoms of a potential safety hazard requiring investigative research. Unanticipated research requirements may also stem from industry petitions to change or make new provisions in safety regulations. Since it is impossible to predict these developments, it may become necessary from time to time to alter research priorities to accommodate these unforeseen requirements.

During FY 1990, the R&D safety program continued to provide critically needed scientific and technical expertise and the test and evaluation capability required to independently and objectively assess industry safety issues. Emphasis continues to be placed on identifying industry trends that indicate the potential for creating increased safety risks in the future. The thrust here is to evaluate any changes contemplated by the industry in response to its economic goals and competition in order to assure that new safety problems do not develop. Recent research and development accomplishments are included in the background statements of each program.

R&D Facilities

This request also includes funds for FRA to clean up its R&D facilities and bring them into compliance with existing law. See General Justification under the program heading.

Magnetic Levitation Transportation

The Research and Development FY 1991 request for maglev will provide funding to continue research for maglev safety standards and to assess the financial and technical basis for engaging the private sector in the development of U.S. maglev systems to restore competitiveness in the American industry.

This new program encompasses research and development activities relating to those technologies associated with non-highway, high speed ground transportation systems that run on rails or electromagnetic guideways, including commuter or other short-haul rail passenger service in a metropolitan or suburban area and high speed ground transportation systems that connect metropolitan areas without regard to whether they use new technologies not associated with traditional railroads. Such terminology does not include rapid transit operations within an urban area that are not connected to the general railroad system of transportation.

In 1991, the emphasis in this new initiative will be two-fold. First, safety research will continue to ensure that adequate measures have been taken to assure the public's safety when the Florida maglev system at Orlando, Florida, begins operation in the fall of 1994. Second, in-depth studies will be undertaken to assess the potential for development of a viable U.S.-based maglev technology.

The proposed program for FY 1991 focuses on magnetic levitation (maglev) systems addressing both of the emerging forms of levitation, electromagnetic (EML) or attractive and electrodynamic (EDL) or repulsive.

In recent years, there has been an increasing interest in maglev as a means of relieving the severe congestion at large airports and on highways. With speeds in excess of 300 mph, maglev will attract large numbers of travelers in the 100-600 mile trip length range and can be financially feasible in several markets. Moreover, the nation's benefits from maglev will be significantly larger if U.S. companies develop the technology and manufacture U.S. maglev systems for world markets.

Presently, the State of Florida is implementing the German maglev system on a short segment between Orlando Airport and a point some 14 miles southwest on International Drive in the vicinity of DisneyWorld and other area attractions. FRA is responsible for the safety of this and future maglev systems. Research currently underway and requested will help form the technical basis for the development of the required maglev safety standards. FRA will learn and expand its overall knowledge of maglev technology from these efforts.

Congress has shown considerable interest in the development of U.S. maglev systems. The Appropriations Committees have directed FRA to prepare a report on the feasibility of commercial U.S. maglev systems and steps necessary to assist development of such systems. This Congressional study will build on individual corridor high speed rail and maglev studies funded by FRA over the last six years. A report by the Maglev Technology Advisory Committee to the

Senate Committee on Environment and Public Works (as requested by Senator Moynihan) recommends a Federally-funded prototype development program as a way to produce U.S. maglev systems. The Federal government would fund all costs of this program, including initial research and development, component refinement, construction of test track(s) and design and implementation of the testing program.

FRA has established an interagency maglev coordinating committee with membership consisting of the Department of Transportation, the U.S. Army Corps of Engineers, and the Department of Energy to help coordinate maglev efforts within the Federal Government. Other Government agencies will be called upon to join in as requirements for their expertise arise.

The Corps of Engineers and the Department of Energy will also be partners with the FRA in this development effort. The Corps has considerable resources and experience devoted to large scale construction efforts and their project management, and research into advanced methods for undertaking such efforts in the most economical manner. The Department of Energy has extensive experience in superconductive magnet technology and energy efficient transportation technologies. These disciplines will be of key importance in further efforts toward a U.S. maglev system development.

The long-range maglev program proposed by FRA differs from a traditional prototype program in that, except for initial research, it will rely on private capital to develop and construct a U.S. maglev system. Initial research sponsored by FRA will develop detailed information on maglev market potential, assess maglev technology and development costs, and assess the availability of private financing. The results of this initial research will form the basis for a prospectus to be used in convincing private interests to undertake the development, manufacture and implementation of a U.S. system. Private financing (limited Federal and state funds may be required) will be used to develop, manufacture, test, and construct the maglev system. The results of the initial research findings will enable a maglev consortium to narrow the scope of additional development activities and may also enable the selection of an initial market for deployment, permitting the long test track to be an initial key segment in a full system and not be scrapped as might be the case in a prototype program.

There are three key elements in FRA's approach. First, the market analysis is crucial to convincing the U.S. manufacturing industry to participate in developing a maglev system using private financing. Second, the technology assessment activity is likewise of major importance to convince investors that the technical risk is acceptable and that the U.S. industry has the wherewithal on which to base design decisions and make economic cost and revenue projections. Both the market and technology assessment activities will benefit from earlier FRA studies. The third element vital to convincing the private sector to invest in maglev development and construction is the availability of development and capital investment funding. FRA will develop a comprehensive prospectus including a financial analysis and identification of prospective private sector financing.

By providing the information on market potential, technical risk and availability of financing, the FRA believes that U.S. industry will accept the challenge to develop a private sector financed, U.S. designed and manufactured, maglev system which will exhibit significant advancements to make it the system of choice for future applications globally. This approach, using state and limited Federal funding, if needed, to convince the private sector to invest in this advanced technology, can be achieved at a fraction of the cost of a Federally funded prototype development program.

FEDERAL RAILROAD ADMINISTRATION

RAILROAD RESEARCH AND DEVELOPMENT
(Dollars in thousands)

SUMMARY TABLE

	FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
Budget Authority (Program Level).....	$9,489	$16,984	+$7,495

ADJUSTMENTS TO BASE AND PROGRAM CHANGES

	Program Level	Authorized Positions	FTEs
FY 1990 Base..................	$9,489	15	15
Adjustments to Base:			
o Comparability pay adjustment	+137	...	...
o Within-grade and merit pay increases.................	+22	...	...
o Terminal leave payments.....	+6	...	...
o Working capital fund........	-38	...	...
o Common service costs........	+6	...	...
o Rental payments to GSA......	+5	...	...
o Travel......................	+6	...	...
o Transportation of things....	+1	...	...
Subtotal, Adjustments to Base...	+145	...	...
Program Changes:			
o Additional position.........	+75	+1	+1
o Equipment, Operations, and Hazardous Materials Safety Research...................	-236	...	...
o Track Safety Research.......	-139	...	...
o Magnetic Levitation and High Speed Rail Technology......	+6,150	...	...
o Environmental Law Compliance (Facilities)...............	+1,500	...	...
Subtotal, Program Changes.......	+7,350	...	...
Subtotal, Increases or Decreases	+7,495	...	...
Total FY 1991 Request	$16,984	16	16

FEDERAL RAILROAD ADMINISTRATION

RAILROAD RESEARCH AND DEVELOPMENT

(Dollars in thousands)

SUMMARY TABLE

Program by Activities	FY 1990	FY 1991 Estimate Adjustments to Base	 Program Changes	 Total Request
Program Level:				
A. Equipment, Operations and Hazardous Materials Safety Research..........	$3,260	$...	-$236	$3,024
B. Track Safety Research..........	4,886	...	-139	4,747
C. Magnetic Levitation and High Speed Rail Technology........	...	...	+6,150	6,150
D. Environmental Law Compliance (Facilities)............	...	...	+1,500	1,500
E. Administration....	1,343	+145	+75	1,563
Total	$9,489	+$145	+$7,350	$16,984

A. EQUIPMENT, OPERATIONS, AND HAZARDOUS MATERIALS SAFETY RESEARCH PROGRAM

BACKGROUND

This program focuses on critical freight and passenger car components, operating practices, and hazardous materials transport in the railroad environment. The program is conducted with the cooperation and some cost-sharing from private sector organizations including the Association of American Railroads (AAR), Brotherhood of Locomotive Engineers (BLE), United Transportation Union (UTU), and individual railroads. During FY 1991, the non-federal share of total research costs within this program is expected to be 25 percent.

Recent accomplishments of this program include: (1) completed a safety assessment of new and untried cars evaluating performance parameters for the acceptance of new equipment in service; (2) completed tests for design strength in buff and draft of new and untried cars; (3) completed tests for evaluating roller bearing performance under adverse conditions; (4) initiated study on the current state of magnetic levitation technology development and potential application in the U.S.; (5) completed tests on heavy 4-axle locomotives in support of establishing crashworthiness features; (6) initiated investigation into brake system performance leading to improved brake designs; (7) completed the development of aptitude tests to be used in screening applicants for locomotive engineer positions and initiated a program for predicting the validity of these tests; (8) supported the nationwide Operation Lifesaver program and joined in the initiation of a cooperative grade crossing demonstration project in Kansas; (9) completed an assessment of the needs and desires of railroad management and locomotive engineers regarding redesign of the locomotive cab and supported a locomotive cab safety inquiry; (10) provided technical support to the U.S. Air Force for the determination of training, training equipment and training facility requirements for operating personnel of Peacekeeper Rail Garrison trains using funds provided by the Air Force; (11) initiated a human factors-oriented safety evaluation of advanced train control systems under development by the railroad industry; (12) initiated an evaluation of stress and fatigue conditions expected to influence engineman performance; (13) completed evaluation of stub sill tank car design improvements; (14) completed evaluation of the stress relief for attachments welded to tank cars; (15) completed evaluation of tank car lining failures; (16) completed testing on failure of tank car frangible discs; (17) completed initial phase of tank car placement study; (18) initiated testing for fatigue crack growth in tank car shells; (19) initiated testing for tank car design and component failure evaluation; (20) initiated testing of two devices for detecting incipient failure in railroad wheels; (21) provided a grant to Amtrak for a study to improve elderly and disabled access between trains and station platforms; and, (22) initiated a study on a report to Congress on an assessment of waste retention technologies suitable for use on rail passenger cars.

In 1991, we will continue safety assessments of new and untried designs of freight cars and validation of simulation models for the acceptance of new equipment. We will continue investigation into freight car component performance including brake systems and truck components. Safety evaluations of advanced train control systems, stress and fatigue influence on enginemen, train dispatching practices, and the ergonomics of proposed new designs for locomotive cabs and equipment will be conducted. Also financial assistance will be provided for the Operation Lifesaver Program and for grade crossing demonstration projects showing promise for improved public protection. Locomotive engineer training will be evaluated with the objective of developing an approach to improving skill levels. We will continue to examine new tank car steels that have the potential for reducing brittle failures and of improving weldability. In addition, we will continue examination of tank car design improvements, especially for components that have displayed failure tendencies.

PROGRAM STRUCTURE AND OBJECTIVES

The Equipment, Operations, and Hazardous Materials Safety Research Program elements and their associated research objectives in support of the rulemaking process, enforcement activities, and enhanced safety practices are as follows:

1. Equipment and Components - Provides sound technical information, analytical procedures, and applied methods and techniques necessary for the test and evaluation of railroad equipment components in the determination of the cause and effect of accidents and the development of preventive measures and improved inspection methods and procedures for application to existing or new equipment.

2. Operating Practices - Provides the information, methodologies, and/or aids necessary to enhance the safety of railroad operating practices with special emphasis on human factors. Evaluates the safety implications of the employee interface with equipment, instrumentation, management and management guidance, and the work environment. Supports public educational activities and the evaluation of innovative approaches to improving safety at railroad-highway grade crossings.

3. Hazardous Materials - Provides factual data concerning tank car failures and accidents involving hazardous materials, including determination of cause and development of measures to prevent failure and protective countermeasures to minimize potentially catastrophic results that may occur in a railroad accident.

RESOURCES

The following project table compares the Fiscal Year 1990 Equipment, Operations, and Hazardous Materials Safety Research Program with that requested for Fiscal Year 1991. The General Justifications for these program elements follow the table.

	FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
1. EQUIPMENT AND COMPONENTS	$1,482	$935	-$547
a. Identify causes of freight car component failures and test for corrective action; continue assessment of new and untried freight cars.	201	385	+184

		FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
b.	Test nondestructive evaluation devices for ability to detect incipient failure of freight car components such as bearings, couplers, and wheels.	150	200	+50
c.	Evaluate improvements to the locomotive design for crashworthiness features to enhance crew safety and improve the work environment.	150	150	...
d.	Investigate and test braking equipment to reduce overheating of wheels and ensure adequate braking of long, heavy trains.	100	200	+100
e.	Provide for Amtrak to research improved elderly and disabled access between rail passenger cars and station platforms.	392	...	-392
f.	Investigate and identify suitable, non-track discharging, toilet and waste retention technologies for use in future passenger car acquisitions by Amtrak.	489	...	-489
2.	OPERATING PRACTICES	$900	$1,111	+$211
a.	Assess training and experience requirements relating to development of operating personnel qualification standards.	50	111	+61

	FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
b. Identify stress and fatigue conditions expected to influence the safety performance of dispatchers and enginemen.	350	350	...
c. Assess, from a human factors perspective, the safety implications of new procedures, equipment and designs under development for consideration within the railroad industry. Of particular concern are advanced train control systems and new design concepts for the locomotive cab.	300	450	+150
d. Develop and distribute educational materials to target groups of the public to improve awareness of the hazards of highway-railroad crossings and participate in the demonstration of innovative improvements to protection and train visibility at crossings.	200	200	...
3. HAZARDOUS MATERIALS	$878	$978	+$100
a. Investigate and conduct studies of failures of tank cars in areas such as inadequate stub sill welding, or defective components (e.g., relief valves and insulation) and evaluate improvements to tank car design to reduce potential for hazardous material releases.	450	478	+$28

	FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
b. Evaluate the fire protection requirements for recently designed radioactive material containers/spent nuclear fuel casks, and for the next generation of spent fuel casks, based on the heat input characteristics of typical railroad accident fires.	128	100	-28
c. Evaluate alternative means of determining the structural integrity of tank cars damaged in accidents and new materials intended for tank car construction.	300	300	...
d. Evaluate the placement of hazardous materials cars in trains based upon latest hazard classes and conduct risk assessments and routing assessments.	...	100	+100
TOTAL	$3,260	$3,024	-$236

GENERAL JUSTIFICATION

1. Equipment and Components

Competition within the transportation industry has led railroads to increase efforts to reduce operating costs. These efforts include introduction of innovative freight car designs, new train concepts, heavier cars (125-ton), longer trains, higher speeds and new components. These changes in railroad equipment and operating procedures require continuous attention to ensure that they do not exceed the safety margin of freight car equipment.

Failure of new equipment designs or car components such as wheels, bearings, couplers, and brakes can cause serious railroad accidents that endanger the public as well as railroad employees. The level of funding requested for FY 1991 is necessary to investigate these potential problems in a timely manner and before safety problems develop. Research will be directed to react to immediate safety concerns while also evaluating the safety aspects of new equipment in the prototype stage of development.

Reliable methods for the identification of potential failure in critical components is an important contribution to accident prevention. Research and development of promising nondestructive testing equipment will continue in the effort to determine high residual stress conditions that lead to equipment failures and derailments.

Investigations will continue to evaluate locomotive control compartment structural and functional arrangements and develop ergonomic requirements to improve the locomotive crew environment as well as to enhance crashworthiness and employee safety in the event of an accident. Research and testing will also continue in an effort to improve on the braking of long, heavy trains, to eliminate uneven dissipation of energy to wheels and to reduce the possibility of derailment during severe braking.

As a result of the grant provided to Amtrak in FY 1990 to study elderly and disabled access between passenger cars and station platforms, it is expected that Amtrak will be capable of implementing improvements in its new equipment purchases. Similarly, it is expected that Amtrak will draw upon the findings of the study on non-track discharging toilet and waste retention technologies and incorporate these advances into its new equipment purchases and rebuild programs.

2. Operating Practices

Approximately 32 percent of train accidents are attributable to human factors causes. In 1987, 14 percent of the human factors caused accidents involved hazardous materials. There were 28 fatalities and 355 nonfatal injuries. To reduce the frequency and severity of such accidents, it is necessary to evaluate the circumstances that lead to these undesirable situations. This program is designed to evaluate employee selection, training, work environment and supervision as well as functional job demands, communication practices and man/machine interface. The increase in this program request reflects the recognized urgency of need for this work and the added impact of the provisions of the Rail Safety Improvement Act of 1988.

In FY 1991, the emphasis of this program will continue to be on qualifications, training, work environment and work practices of operating personnel, particularly locomotive engineers and train dispatchers. Train handling and train control are complex jobs requiring a wide range of knowledge, skills and abilities to be applied in a difficult work environment.

Ergonomic elements of both the engineer's and dispatcher's work environments include: shift duration, work/sleep cycles, boredom, task difficulty and saturation, thermal and noise effects, and personal problems. In addition, the engineer must endure the effects of weather and vibration. These conditions contribute, in varying degrees, to stress and fatigue that are thought to result in degradation of employee performance. These conditions and their contribution to stress and fatigue will be evaluated with an eye toward identifying those which most affect performance and then to determine practical approaches to either eliminating the cause or minimizing the effect.

The railroad industry is developing advanced train control systems and considering redesign of the locomotive cab. Both will affect locomotive engineer and dispatcher training requirements, work environment, job demands, and operating practices. They will be evaluated for safety implications in these areas of concern. New locomotive cab design standards are generally expected to be uniform industry-wide. On the other hand, advanced train control systems are being developed in a variety of system configurations on different railroads. Features unique to each must be evaluated for their impact upon operational safety.

In 1987, there were approximately 2,200 accidents at railroad-highway grade crossings. These accidents produced over 2,400 casualties, including 624 fatalities. In an effort to improve this record, FRA will continue to support the public education efforts of the nationwide Operation Lifesaver Program and to participate in projects demonstrating innovative approaches to increased protection and train visibility at crossings.

3. Hazardous Materials

Although there have been major improvements in tank car puncture and thermal protective equipment in the past few years, there is continuing evidence of failure of tank car components such as rupture discs and the recent development of cracks in the welding of some types of tank cars that, until detected, pose a high potential for catastrophic consequences. An institution of higher education is assisting in the welding analysis. In addition, numerous incidents involving hazardous material leaks from fittings, valves, closures, and rubber lining failures have recently been reported. In FY 1991, emphasis will continue to determine the causes of component failures and to evaluate means of determining the structural integrity of damaged tank cars.

The tank car industry has been investigating the use of new tank car construction materials. In FY 1991, the focus on tank car design will include evaluation of these proposed new materials in order to continue to ensure adequate protection should the cars be involved in derailment accidents.

Research will also continue in railroad transportation of spent nuclear fuel in both containers and casks to make certain the transport of these materials remains safe in the potential of an accident environment.

Recent changes in packaging requirements and hazardous materials classification requires FRA to initiate an evaluation of the placement of hazardous materials cars within a train's makeup, and to initiate new risk assessment/routing studies.

B. TRACK SAFETY RESEARCH PROGRAM

BACKGROUND

This program encompasses safety research in both track components and track-vehicle interaction. The present program format for the Track Safety Research Program began in FY 1989 and continues in this Fiscal Year. One of the major facilities for testing the safety limits of track components and track geometry is located at the Transportation Test Center (TTC) in Pueblo, Colorado. Funds required for individual experiments must bear a proportionate share of the cost to operate the donated train which is used to provide the controlled load on the track at TTC.

In FY 1991, the Track Safety Research Program will continue to focus on improving safety of the track structure including all of its critical components, railroad bridge structures, signal and train control systems, relationships between railroad track and the dynamic response of railroad vehicles, safety requirements for track and all other elements of the railroad right of way having any influence on the safe operation of trains.

This program is conducted with the cooperation and some cost-sharing from private sector organizations including the American Railway Engineering Association, Association of American Railroads, several individual railroads, and suppliers. These groups are expected to contribute about 53 percent of the estimated project costs in the Track Safety Research Program.

Recent accomplishments of this program include: (1) completion of Phase IV and Phase V track lateral resistance tests; (2) completion of a cooperative test on a portion of CSX (the Chessie System) track to assess the influence of track maintenance activity on track lateral strength; (3) completion of the rail longitudinal force measurement evaluation pilot test; (4) completion of rail neutral temperature variation tests under controlled thermal cycling; (5) conduct of cooperative tests to measure rail lateral resistance with the Gage Reserve Measurement System (GRMS) on portions of the Union Pacific, Burlington Northern, Norfolk Southern, CSX, and the Chicago and Northwestern Railroads; (6) preparation of test plans for evaluating 25 mph test speed of the GRMS system; (7) completion of a cooperative assessment of a rail test scheduling guide on segments of the Union Pacific and Southern Pacific Railroads; (8) initiation of a bilateral (US-Poland) research project on rail rolling contact fatigue; (9) completion of the first 100 million gross tons (MGT) of testing 125-ton freight cars on the Facility for Accelerated Service Testing (FAST) at the Transportation Test Center (TTC); (10) performance of static and in-motion tests of the Controlled Track Loading Vehicle (CTLV) to demonstrate its safety testing capabilities; (11) conduct of in-service tests of a rail car with known fatigue failure problems, and completed testing of the same car type on the Simuloader test device at the TTC to study the limits of safe fatigue life; and (12) initiation of testing of a series of aluminum alloy freight car components to develop a means for predicting fatigue life of new rail cars.

In FY 1991, the accent in this program will continue to be on overcoming any impediments that may be discovered in the practical application of the track safety performance standards, expanding the knowledge and understanding of rail defect initiation and growth, particularly under 125-ton cars, examining additional factors influencing track buckling tendencies, implementing a plan for rationalizing present methods of estimating train signal system reliability, examining alternative approaches or refinements in advanced inspection device technology, and continuing to evaluate track degradation and track inspection strategies.

PROGRAM STRUCTURE AND OBJECTIVES

The Track Safety Research Program elements and their associated research objectives in support of the rulemaking process, enforcement activities, and safety improvements are as follows:

1. Track and Components - Provides sound technical information, analytical procedures, and guidance that will improve the reliability of track structural components and associated signal and train control systems and determine their safe operating limits.

2. Inspection-Detection - Provides the inspection equipment, techniques, and methodologies necessary to ensure early and reliable detection and warning of unsafe track and structure conditions.

3. Track-Train Interaction - Provides for the collection of historical information, analysis, and production of factual test data that accurately portrays the effect of the dynamic interaction that occurs between a train and the track and bridge structures over which they ride.

RESOURCES

The following project table compares the Fiscal Year 1990 Track Safety Research Program with that requested for Fiscal Year 1991. The General Justifications for these program elements follow the table.

	FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
1. TRACK AND COMPONENTS	$2,325	$2,325	...
a. Conduct additional testing in support of the track buckling performance standard to provide the necessary safety margin to prevent track buckling when exposed to temperature variations, railcar loading, train braking, and locomotive traction on various track alignments and constructions.	825	825	...
b. Conduct studies and testing using the Facility for Accelerated Service Testing and other test capabilities at TTC to provide the test data on the causes and rates of defect occurrence and rail failure as related to ultra-heavy cars (125 net tons), and manufacturing/metallurgical processes (i.e., roller straightening, welding, alloying, or treating measures) to extend rail life and reduce train accidents caused by rail defects.	900	900	...

		FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
c.	Analyze the performance and failure modes of currently designed turnouts, switches and signal systems, and from the results develop a plan for replacing the present empirical methods of estimating reliability and durability with quantitative criteria for inspection and maintenance to reduce the incidence of train accidents attributed to these components.	600	600	...
2.	INSPECTION-DETECTION	$1,786	$1,747	-$39
a.	Provide engineering and analytical support necessary to maintain, calibrate, and operate Government rail vehicle and track testing equipment (data acquisition cars) and specialized instrumentation in the conduct of safety research testing, data collection, and analysis of test results.	400	400	...
b.	Provide for development and application of advanced analytical evaluations and tests of advanced technology inspection means, provide test planning and data analysis technical support, and provide safety evaluation technical support.	486	447	-39

	FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
c. Evaluate track degradation characteristics and rates, as a function of track usage and initial track quality, to develop safety inspection intervals and appropriate actions to be taken when defective conditions are detected.	900	900	...
3. TRACK-TRAIN INTERACTION	$775	$675	-$100
a. Conduct specific safety projects in the vehicle-track systems area to study technical issues involving the interaction between railroad rolling stock, track and track structures.	200	200	...
b. Conduct analyses and tests intended to reduce derailments resulting from vehicle-track interaction by defining limiting track wear conditions and vehicle speed limits.	575	475	-100
TOTALS	$4,886	$4,747	-$139

GENERAL JUSTIFICATION

1. Track and Components

The rate of railroad accidents in recent years is much lower than the average of a decade earlier. However, track defects continue to be a leading cause of train accidents. There is the need for future improvements which are still possible and necessary. In spite of significant maintenance and rehabilitation progress by the railroads, accidents caused by the failure of track components result in derailments having severe consequences. Many new techniques and philosophies concerning track maintenance have been developed, but the long-term implication of these processes is unclear. Faster trains, heavier cars, new car designs, different materials, and more advanced components continue to be introduced into the railroad operating environment. How these changes relate, one to the other, is not yet obvious. The newly developed track safety performance standards need to be demonstrated under a variety of operating conditions that are representative of revenue service. This research program utilizes the controlled environment at FAST and other test tracks at the Transportation Test Center as well as facilities owned by cooperating railroads to secure accurate and time-accelerated results. Metallurgical studies are also conducted at institutions of higher education in an effort to identify failure mechanisms.

In addition to the more commonly considered track components, this program includes research on special track work such as switches and turnouts as well. Closely associated with switches are signal system components designed to indicate clear passage over diverging track routes. Safety analysis of those signal systems is included in this subprogram.

The requested FY 1991 funding reflects the continued emphasis placed on the testing, analysis and evaluation of safety critical track and signal components.

2. Inspection-Detection

The risk of train accidents that results from failure of track or structures can be further reduced if continuing efforts to improve rail flaw and other track structure failure detection techniques and related inspection equipment are successful. New techniques and equipment will provide accurate and reliable warnings well in advance of structural failure of track or bridges.

In FY 1991, test support continues to be provided for testing of track safety performance standards in order to identify problems that may occur in the implementation of these specifications.

Technical support for advanced inspection technology is being continued in order to obtain the necessary expertise to conduct independent evaluations and demonstrations of the safety effectiveness of new inspection devices. This work includes the continued evaluation of an inspection device for detecting incipient track buckling conditions and a device to nondestructively measure the ability of track to withstand lateral gage-widening loads.

A strategy to determine the risk of failure of track-carrying structures, including bridges, is proposed to permit the objective evaluation of the remaining fatigue life of these structures in light of their advancing age, increased car weights, and the recent widespread transfer of properties to regional and shortline railroads.

The FY 1991 funding level reflects the continuing demand for analysis and testing efforts directed toward the development of a variety of inspection devices for detecting incipient critical failures of track and structure. When utilized in a comprehensive inspection program based on strategies developed in track and bridge degradation studies these devices will permit detection of dangerous conditions that otherwise might go undetected using contemporary inspection techniques and procedures.

3. Track-Train Interaction

Many accidents not involving human error, vehicle or track component failure are caused by undesirable track-train interactions. As new vehicles and track designs continue to be proposed, potential safety reactions associated with train handling need to be understood before widespread use of new vehicle-track systems begin.

Complementing the vehicle-track systems research will be a series of vehicle-track dynamics tests conducted at the Transportation Test Center (TTC) and on revenue freight tracks that will be followed by analyses to examine new vehicle and track problems not otherwise covered. It is essential that FRA promptly and thoroughly investigate potentially dangerous problem areas as they are recognized. Technical support to accomplish this independent assessment of industry problems is critical.

The FY 1991 funding level reflects the continued importance of the potentially profound impact that variations in vehicle design, operating practices, or track maintenance procedures can create as the rail vehicle and track structure interact as a whole system.

C. MAGNETIC LEVITATION AND HIGH SPEED RAIL TECHNOLOGY

BACKGROUND

An evaluation of the safety aspects of deploying foreign technology-based magnetic levitation in the U.S. was initiated late in FY 1989. This was deemed to be a critical need in light of the rapidly developing maglev and high speed rail projects in Florida and the responsibilities assigned to FRA by Section 7 of the Rail Safety Improvement Act of 1988. Some reordering of research priorities was necessary to accommodate this effort.

In the FY 1989 Appropriations Committee Conference Report (100-957), Congress directed FRA to conduct "an assessment of the current state of magnetic levitation technology including an analysis of the economic and technical feasibility of constructing commercial magnetic levitation transportation systems in the U.S. over the next 20 years and the identification of legislative or other measures that could be undertaken to promote U.S. industry leadership in the production of such equipment." This report is scheduled to be completed during FY 1990 and submitted to the Congress in June 1990. This analysis will provide the foundation for the additional assessments planned in FY 1990-91 to examine further the future potential for the private sector development of these systems using U.S.-based technology in place of systems developed in other countries.

PROGRAM STRUCTURE AND OBJECTIVES

The Magnetic Levitation and High Speed Rail Technology Program work elements and their associated research objectives in support of the furtherance of safe and effective ground guided transportation systems are listed below.

The first work element of each program except Transportation and Environment includes the maglev safety standards evaluation activity in support of the development of U.S. safety standards applicable to any U.S. maglev implementation project. The remaining work elements pertain to the overall strategic plan for the private sector development and implementation of a U.S. designed maglev system. Item 1, Transportation and Environment addresses the market studies portion of the plan; Items 2, 3, and 4, Vehicle, Guideway and Control, and Systems Integration are part of the technology assessment studies; and the last part of the plan, the prospectus development and financial assessment, will rely on the output from these other activities and will be accomplished in FY 1992.

Market Potential Analysis

1. Transportation and Environment--Provides comprehensive market feasibility studies to support decisions relating to private sector involvement in maglev development and implementation. Provides improved methodology for and examines issues of critical importance in conducting risk studies, including studies sponsored not only by government but also by private industry and investors.

Technology Assessment

2. Vehicle Systems--Provides for sound use of technical information, analytical procedures and applied methods and techniques in the identification of existing and advanced technologies suitable to application in high speed rail and magnetic levitation transportation system **vehicles** including their propulsion, levitation, structural makeup, and other components and for the technology assessment and evaluation necessary to assure their safe application and effective performance.

3. Guideway and Control Systems--Provides for sound use of technical information, analytical procedures and applied methods and techniques in the identification of existing and advanced technologies suitable to application in high speed rail and magnetic levitation transportation system **guideway structures and control systems** and for the technology assessment and evaluation necessary to assure their safe application and effective performance.

4. Systems Integration--Provides for the application of the interdisciplinary systems approach in ensuring that all components of a high speed rail or magnetic levitation system are integrally compatible with respect to each other including such aspects as electromagnetic compatibility, dynamic interactions, environmental influences, hazard detection, and human factors issues.

RESOURCES

The following project table compares the Fiscal Year 1990 Magnetic Levitation and High Speed Rail Technology Program with that requested for Fiscal Year 1991. The General Justifications for these program elements follow the table.

	FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
1. TRANSPORTATION AND ENVIRONMENT	...	$600	+$600
a. Conduct comprehensive market feasibility studies of potential high speed maglev applications.	...	400	+400
b. Develop improved methodology and critical issues analysis for use in considering high speed maglev applications.	...	200	+200
2. VEHICLE SYSTEMS	...	$2,650	+$2,650
a. Evaluate safety and operational issues related to vehicles in proposed maglev installation and determine the suitability of foreign technology safety provisions for the U.S. environment.	...	300	+300
b. Examine the propulsion alternatives available and assess the technical risk and tradeoffs for the advancement of the existing state of the art in linear electric propulsion, including combined propulsion and levitation in maglev applications.	...	900	+900

	FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
c. Examine alternatives available in maglev levitation and suspension systems and determine the most appropriate opportunities for advancement of the state of the art.	...	900	+900
d. Examine vehicle design considerations to identify system dynamics of speed, lift to drag ratio, ride quality, horizontal and vertical curve limitations, control and braking system characteristics to determine opportunities for optimization of performance.	...	550	+550
3. GUIDEWAY AND CONTROL SYSTEMS	...	$1,350	+$1,350
a. Identify safety and operational issues related to guideway and train control systems in proposed maglev installations and determine the suitability of foreign technology safety provisions for these U.S. applications.	...	300	+300

	FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
b. Conduct analytical studies and tests of guideway structures, including special trackwork or diverging route structures for maglev systems development.	...	550	+550
c. Conduct analysis and tests on the performance and failure modes of proposed signal, train control, and hazard detection systems and develop criteria for the design, construction, inspection, and maintenance of these systems to improve reliability and minimize the risk of disruptive occurrences.	...	500	+500
4. SYSTEM INTEGRATION	...	$1,550	+$1,550
a. Evaluate the total system safety performance of existing maglev technology and other interdisciplinary aspects with respect to the overall system such as vehicle-guideway interaction, speed and location control, emergency provisions, accident prevention measures and human factors including magnetic infringement on the body.	...	450	+450

	FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
b. Investigate and test the dynamic behavior of high speed maglev vehicles over the anticipated operating speed range to determine safe and reliable limits of horizontal and vertical alignment, levitation and guidance magnet gap, guideway irregularity, and structural response to vehicle vibration.	...	300	+300
c. Study the effects of adverse environmental influence, such as high wind, ice, earthquake or power distribution systems on vehicle or guideway performance.	...	200	+200
d. Assess the influence of super speed ground transportation on the safety of adjacent transportation modes and property owners and with respect to its intermodality with other transportation modes.	...	100	+100
e. Formulate a long-range strategic plan identifying the primary issues in developing a U.S. maglev system, areas with potential for significant technological improvement, financing mechanisms, and their attendant risks and develop a project management master plan for program implementation.	...	500	+500
TOTALS	...	$6,150	+$6,150

GENERAL JUSTIFICATION

With growing congestion on the Nation's highways and at airports, the large expense to build or expand new facilities, and the increased awareness of the dramatic success of French and Japanese high speed rail systems, a number of states have expressed interest in developing high speed rail operations. FRA has made grants to study market and financial feasibility of high speed rail systems under a program whose funds have now been exhausted. States (especially Florida) have been willing to spend substantial amounts of their own money in such studies.

The high speed systems being considered by the states have top speeds ranging from 125 to 300 miles per hour. Generally, at less than 200 miles per hour, the technology uses steel wheels on steel rails and is already in use in Europe and Japan. At speeds above 200 mph, magnetic levitation (maglev) technology is used where trains move above a guideway without contact, supported and guided by magnetic fields. High speed maglev technology is currently under development in Japan and West Germany. The German system is in prototype test at the present time and is planned for installation between the Orlando International Airport and a point some 14 miles southwest on International Drive in Orange County, Florida, in proximity to DisneyWorld and other area attractions. Construction is to begin in the fall of 1990.

As regulator of rail safety, FRA has a statutory role in high speed rail development. Section 7 of the Rail Safety Improvement Act of 1988 reaffirmed FRA's jurisdiction over the safety of high speed rail systems, including maglev. FRA will be required to adapt its regulations or develop new regulations for this new technology. To do this will require a systematic identification of deficiencies in current Federal, trade association, industry and foreign standards, and defining the research and testing necessary to establish high speed safety requirements for both conventional rail and magnetically levitated vehicles. By developing appropriate regulations, we will remove any uncertainty about the nature of the systems that will comply with FRA safety regulations. Thus, high speed rail and maglev system planners will be better able to estimate the cost of development and operation. It was with this understanding that FRA initiated, in FY 1989, its systematic research effort reviewing standards pertaining to maglev. This effort in FY 1991 is estimated to cost $900,000.

Drawing on the initial assessment of the technical and economic feasibility of commercial U.S. maglev transportation systems done for the Congress, FRA proposes to start in Fiscal Year 1991 a more in-depth, comprehensive examination of the issues highlighted in the June 1990 report. With the incorporation of detailed transportation and environment market analyses and more pervasive technology assessment activities, the purpose of the research and development is to provide the private sector with sufficient information to decide if they should invest in a public-private sector partnership in the research and private sector investment in the development and operation of a U.S.-designed maglev system. The products of the combined work will result in a strategic plan or prospectus with pro forma. Included will be a project management master plan for the R&D life-cycle of the project.

The market evaluation will build on previous high speed rail market feasibility studies to assess the financial feasibility of maglev in promising U.S. markets. Both high density corridors and hub-type markets will be evaluated. The evaluation will consider use of existing highway and railroad rights-of-way.

The technology assessment activity will build on the past R&D to answer the questions still remaining and show that there is an acceptable development risk. The approach proposed is to use the FRA R&D on maglev conducted in the early 1970's, the UMTA sponsored research from the early 1980's and other research available in the public domain to form the data base against which we will evaluate the current technology (as exemplified by the German Transrapid design proposed for U.S. application). The results of this evaluation will allow us to identify the advancements in technology necessary to improve the performance and reliability of maglev which will make a U.S. private sector-developed maglev system a strong competitor, and, ultimately, the system of choice, for application in the U.S. and elsewhere. The technology assessment will be conducted to demonstrate that the required improvements can be achieved with acceptable risk and cost. The results of our research will be in the form of performance-type requirements and data on benefits and tradeoffs which can be used by a private sector manufacturer to make final design decisions.

Project work elements for technology assessment activities will include the updating of earlier research on levitation technology (repulsion using superconducting magnets versus advancements in attraction technology), changes in propulsion concepts to integrate levitation and propulsion functions (based on the earlier UMTA sponsored work), changes in the guideway system needed to be more cost effective, changes and evaluation of the vehicle and control systems to improve the stability and dynamic interaction with the guideway, evaluating tradeoffs with guideway geometric tolerances and evaluation of the influence of external environmental effects (such as rain, snow and ice, topographical and geological factors) on the design.

1. Transportation and Environment--To guide a program of private sector research and development on magnetic levitation technology and as a key component of a strategic plan or prospectus for maglev development in the U.S., the FRA proposes to prepare comprehensive feasibility studies of building commercially viable systems in the U.S. These studies will build upon and refine the information assembled for the report to Congress on the same subject in June 1990. Because of the limited program resources available from carryover in FY 1990, that information will not be in sufficient detail to serve as a basis for major private sector R&D investment decisions. Also, although the FRA gave grants to states and

localities for high speed rail feasibility studies in the mid-1980's, a reasonably detailed treatment of maglev was done in only two of those studies, and a number of key markets were not covered in the studies.

At the same time, FRA proposes to make further improvements in the methodology for high speed rail and maglev feasibility studies and to examine critical issues which are important for maglev development. The methodology improvements will include better ways to use available air travel data, original market research on intercity travel, cost estimation, and preliminary route location methods. The issues to be examined will be how design speed criteria influences guideway design and systems cost, use of interstate highway rights of way, service to major hub airports, and linking of maglev corridors, such as those radiating from Chicago, into networks. The improved methodology and issue studies are intended for use not only by the Federal Government in its strategic planning but also by potential state and local governments and industry sponsors of maglev systems.

2. Vehicle Systems--In the execution of its safety mission, the FRA often requires factual scientific and technical information upon which to base its proposed rulemakings. This is particularly acute when new and pioneering technologies such as maglev are involved. As a result, an assessment is required and will be made to determine the safety requirements for the proposed maglev transportation systems to be implemented in Florida and elsewhere. Because of the high likelihood that the initial systems to be deployed in the U.S. will be based upon foreign technology, it will be necessary to identify the rationale and basis for the safety standards developed with these foreign technologies. Accordingly, FRA initiated a preliminary assessment of the proposed Orlando, Florida, maglev installation and its associated German-developed safety standards in the summer of 1989. This work continues in FY 1991 with the emphasis on determining whether the German standards are applicable, appropriate, and acceptable as a suitable interim prototype for a U.S. standard for maglev systems, particularly with respect to vehicle fabrication and testing.

The earlier FRA work on magnetic levitation in the 1970's had tested conceptual designs for both the repulsive and attractive forms of maglev systems. The designs were to have been used in rocket sled demonstrations to verify the suspension systems. Both programs were terminated prior to test equipment construction due to a reordering of DOT priorities. An update of the earlier research will include evaluation of the attractive or electromagnetic suspension system (EMS) and repulsive or electrodynamic system (EDS) and further assessment of cryogenic reliability and high temperature superconductivity potential (HTSC). The risks and benefits of the superconducting magnets and cooling system of the repulsive system and the vehicle stability and control issues of the attractive system will be evaluated, as well as the question of the effect of magnetic suspension failures such as quenching.

Although a scale model experimental test vehicle effort was performed by a laboratory demonstrating the stability of a levitation system, additional research is needed to assess other vehicle design characteristics which are to be compatible with the system dynamics of speed, including lift-to-drag ratio, ride quality acceptability, curve negotiation, and suspension control and braking systems.

Similarly, experiments were conducted with single and double-sided linear induction motors (LIM), and testing was started on linear synchronous motors. These systems offered the most promising of propulsion concepts for magnetic levitation systems at the time. Further research is now required to assess the most efficient and practical system for compatibility with maglev. Integrated linear synchronous motor and magnetic levitation system designs will be evaluated versus the more conventional designs to assess the risk and benefits.

3. Guideway and Control Systems--Like in the vehicle program above, this program will focus on the safety and operational problems here involving the track or guideway over which these new high speed systems will operate and the train control systems designed to govern operation over selected routes. Information is required in order to adequately assess the safety and performance of a particular guideway design under various foundation conditions and under different vehicle operation applications. In particular, investigations must be conducted concerning guideway material, design, inspection, and maintenance and the examination of the behavior of vehicles over that guideway across the speed range contemplated. Serious safety and operational implications will, no doubt, be addressed in the study of train control systems, including hazard detection and route selection where diverging routes or passing sidings may be required to meet operational demands.

Detailed evaluation of maglev guideway alternatives must be undertaken to assure compatibility in many different topographical and environmental situations in the U.S. Included in such evaluations will be foundation studies to determine vibration effects on subgrade stability, vertical and horizontal alignment requirements, curve negotiation, compatibility of magnet gap and guideway irregularities and structural response to vehicle vibration and load. Considerable work needs to be done on evaluating guideway turnout design, including the control systems for vehicle route selection. The interaction of vehicle design and control requirements versus guideway tolerances will also be critically studied.

4. Systems Integration--In assessing the safety of any system, it is essential to exercise the systems approach in determining what, if any, are the most vulnerable components of the system and what makes them so. From this failure analysis finding, remedial action can be recommended. Similarly, an assessment is necessary to determine the environmental influences on the system and their effect on performance. Such environmental factors as wind, rain, snow, ice, earthquakes, operation in tunnels, opposing vehicle passage, debris

in the guideway path, high voltage power distribution and other electromagnetic effects on train control systems will be investigated to determine their potential impact on the system and the appropriate remedial design measures to be taken. At the same time, the effect of maglev operations on the outside environment such as electromagnetic interference and noise to surrounding areas and shared routing with other transportation modes will be studied.

Experience has shown that conventional trains have had problems with vehicle and track interaction until the causal issues were identified and subsequently remedied. Therefore, a study will be initiated to determine which similar problems could arise in high speed maglev train operations. Tests will be defined for evaluation of the issues along with the evaluation of potential solutions for subsequent private sector development efforts.

Managing the development and production of a safe system in the application of new technology inevitably carries technical risk. Therefore, any U.S. maglev development plan will need to include preliminary feasibility studies and should allow for a degree of iteration in the development process and a certain amount of prototyping and experimental work. To accomplish this in a careful and thorough manner, it is necessary to develop first, up front, a strategic plan or approach that recognizes the primary issues surrounding development; in the case of a U.S. maglev system, its market potential, areas with potential for significant technological improvement over the existing systems, the financing mechanisms available and the attendant risks involved. Having completed this process, it will be necessary to develop a project management master plan that further addresses all of these issues and maps the course to be followed, actions to be taken and the estimated costs thereof throughout the project's life-cycle.

D. ENVIRONMENTAL LAW COMPLIANCE (FACILITIES)

BACKGROUND

The Transportation Test Center (TTC) near Pueblo, Colorado, is a Government-owned, contractor-operated facility. The Federal Railroad Administration has ownership responsibilities and the Association of American Railroads is the private facility operator under a "Care, Custody and Control of the Transportation Test Center" contract. The AAR and the FRA are currently under a compliance order from the Colorado Department of Health to clean up a waste water lagoon. In addition, the AAR must remove PCB oils from transformers, has provided information to the local community under Title III of SARA (Superfund Amendment and Reauthorization Act), has evaluated other TTC sites that may need to be cleaned up in order to comply with RCRA (Resource, Conservation and Recovery Act) provisions and is evaluating the requirements for bringing underground hydrocarbon storage tanks into compliance with EPA regulations.

Most of these conditions predate the AAR assumption of control of the TTC and are, in this case, a shared responsibility. The FRA is not eligible for funding under SARA and must seek other means of funding its share of the clean up. Through a "discovery" process the ultimate cleanup costs will be determined. Additional funding needs can be expected in the out-years.

RESOURCES

The following table compares the Fiscal Year 1990 Environmental Law Compliance (Facilities) Program area with that requested for Fiscal Year 1991.

	FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
Environmental Law Compliance	...	$1,500	+$1,500

JUSTIFICATION

By executive order, Federal agencies are instructed to comply with appropriate EPA, state and local environmental regulations. The FRA is under a compliance order to clean up the RCRA violations for a waste water lagoon at the TTC. In addition, there are several other sites that require clean up to be in compliance with environmental requirements. It is these sites that require further "discovery" efforts in order to determine the extent of the problem. For example, underground petroleum storage tanks must be safe from leakage and require detailed examination and modification and/or replacement.

E. ADMINISTRATION

MISSION

The Director and staff of the Office of Research and Development are responsible for the management and execution of all aspects of research for railroad safety and intercity guided ground transportation in order to improve safety and stimulate beneficial advances in technology.

RESOURCES

The following table compares the Fiscal Year 1990 Administration Program area with that requested for Fiscal Year 1991:

	FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
Administration...............	$1,343	$1,563	+$220
Permanent Positions..........	15	16	+1

JUSTIFICATION

This program area includes the salaries and related expenses to provide for the technical and management expertise required to administer the preceding research and development programs.

EXPLANATION OF CHANGES:

Adjustments to Base	+145

- Comparability Pay Adjustment .... +137

  Increased costs of the January 1990 pay increase (3.6 percent) for a full year in 1991 and costs for three-quarters of the 50 percent not absorbed of the January 1991 (3.5 percent) pay increase, for FRA employees as well as other Federal agency employees providing contract and reimbursable services to FRA.

- Within Grade and Merit Pay Increases .... +22

  This increase is to cover the additional costs of salaries and benefits due to within grade step increases and merit pay increases and performance-based awards.

- Terminal Leave Payments .... +6

  It is estimated that an increase of $6,000 is necessary to cover the costs of anticipated terminal leave payments due to retirements.

- Working Capital Fund .... -38

  It is anticipated that the DOT working capital fund charges for library, health center, telephone, computer time sharing, building management and other sources will decrease by $38,000 in FY 1991 to a total of $52,000.

- Rental Payments to GSA .... +5

  In FY 1991, it is estimated that the General Services Administration charges for headquarters office space will increase by $5,000 to a total of $87,000.

- Travel .... +6

  An additional $6,000 is needed to cover per diem and mileage rate increases and telephone allowance that were effective in October 1988. The total estimate for FY 1991 is $72,750.

- Transportation of Things............................... +1

  It is anticipated that an increase of $1,000 is necessary to cover additional costs for providing for disposition of Government-owned equipment acquired through the contractual program. The total estimate for FY 1991 is $4,000.

- Common Service Costs................................... +6

  It is anticipated that an additional $6,000 is necessary to cover the increase in common service costs such as FAA payroll administration, U.S. postal services, USCG health facilities and GSA store supplies.

Program Changes.. +75

- Additional Position.................................... +75

  One additional position and full time equivalent is requested to support the expanded program workload from magnetic levitation and high speed technology research in the Office of Research and Development. An additional $75,000 is required for salaries, benefits and related administrative expenses. Since the new program area will introduce a significant element of work involving both high voltage electrical and sophisticated command and control electronic circuity, a senior level electrical-electronic engineer is needed to support the existing multi-discipline team of civil, mechanical and general engineers.

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Case 220

STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
FREIGHTLINE REHABILITATION

Program and Financing (in thousands of dollars)

Identification code 69-0713-0-1-401	19 actual 89	19 estimate 90	19 estimate 91
Program by activities:			
10.00 Total obligations (object class 41.0)..........	6,000	...	...
Financing:			
40.00 Budget authority (appropriation)......	6,000	...	...
Relation of obligations to outlays:			
71.00 Obligations incurred, net..................	6,000	...	...
72.40 Obligated balance, start of year........	...	1,590	...
74.40 Obligated balance, end of year..........	-1,590	...	...
90.00 Outlays............	4,410	1,590	...
(Mono cnt: 21.6)	(Mono cnt: 8)	(Mono cnt: 8)	(Mono cnt: 4.8)

FREIGHTLINE REHABILITATION

PROGRAM AND PERFORMANCE

In 1989, funds were provided for a grant to the Soo Line Railroad Company for track improvements to maintain Amtrak's rail passenger service in Wisconsin. No funds are requested in 1991.

Type size:
8 point 33 picas
Case 180.
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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
CONRAIL LABOR PROTECTION

Program and Financing (in thousands of dollars)

Identification code 69-0707-0-1-603	19 89 actual	19 90 estimate	19 91 estimate
Financing:			
17.00 Recovery of prior year obligations............	-2	...	...
21.40 Unobligated balance available, start of year.................	...	-2	...
24.40 Unobligated balance available, end of year.	2	...	...
39.00 Budget authority.....	...	...	...
Relation of obligations to outlays:			
71.00 Obligations incurred, net...................	...	2	...
78.00 Adjustments in unexpired accounts..............	-2	...	...
90.00 Outlays................	-2	2	...
(Memo cost: 21.0)	(Memo cost: 8)	(Memo cost: 8)	(Memo cost: 4.0)

CONRAIL LABOR PROTECTION

PROGRAM AND PERFORMANCE

Funds in this program were provided under the Regional Rail Reorganization Act, as amended, for benefits to Conrail employees deprived of employment because of workforce reductions and other actions. This program no longer exists since Conrail has been returned to the private sector. Unobligated balances will be returned to Treasury in 1990.

[CONRAIL COMMUTER TRANSITION ASSISTANCE]

[For necessary capital expenses of Conrail commuter transition assistance, not otherwise provided for, $5,000,000, to remain available until expended.] (Department of Transportation and Related Agencies Appropriation Act, 1990.)

STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
CONRAIL COMMUTER TRANSITION ASSISTANCE

Program and Financing (in thousands of dollars)

Identification code 69-0747-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
10.00 Total obligations (object class 41.0).............	4,500	4,920	...
Financing:			
39.00 Budget authority..........	4,500	4,920	...
Budget authority:			
40.00 Appropriation	4,500	5,000	...
40.00 Reduction pursuant to P.L. 101-164...........	...	-15	...
40.00 Reduction pursuant to P.L. 99-177............		-65	...
43.00 Appropriation (adjusted)	4,500	4,920	...
Relation of obligations to outlays:			
71.00 Obligations incurred, net.	4,500	4,920	...
72.40 Obligated balance, start of year..................	9,481	12,184	10,863
74.40 Obligated balance, end of year....................	-12,184	-10,863	-5,067
90.00 Outlays.............	1,796	6,241	5,796

CONRAIL COMMUTER TRANSITION ASSISTANCE

PROGRAM AND PERFORMANCE

These funds helped to defray the one-time only start-up costs of commuter service and other transition expenses connected with the transfer of rail commuter services from Conrail to other operators. Between 1986 and 1990 funds were appropriated to fund commuter rail and bridge improvements in the Philadelphia, Pennsylvania, region. No additional funds are requested in 1991.

SETTLEMENTS OF RAILROAD LITIGATION

For the payment of promissory notes pursuant to section 210(f) of the Regional Rail Reorganization Act of 1973 (Public Law 93-236), as amended, $3,097,000, to remain available until expended, together with such sums as may be necessary for the payment of interest due to the Secretary of Treasury under the terms and conditions of such notes.

STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
SETTLEMENTS OF RAILROAD LITIGATION

Program and Financing (in thousands of dollars)

Identification code 69-0708-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
10.00 Direct loans (total obligations (object class 43.0)..	213	226	265
Financing:			
39.00 Budget authority........	213	226	265
Budget authority:			
40.00 Appropriation (definite)............	...	...	3,097
40.00 Appropriation (indefinite)...........	...	...	265
40.47 Portion applied to debt reduction.............	...	...	-3,097
43.00 Appropriation (adjusted)........	...	...	265
47.10 Authority to borrow (87 Stat. 1001).......	213	226	...
Relation of obligations to outlays:			
71.00 Obligations incurred, net....................	213	226	265
72.40 Obligated balance, start of year..........	...	213	...
74.40 Obligated balance, end of year...........	-213	...	...
90.00 Outlays	...	439	265

SETTLEMENTS OF RAILROAD LITIGATION

PROGRAM AND PERFORMANCE

In 1981, the Government began valuation settlements with railroads for properties transferred to Conrail in 1976. Total settlements made amount to $2.8 billion.

This appropriation would repay borrowings from the Department of Treasury. The borrowings paid for the properties of the Penn Central Transportation Company and their subsidiaries and affiliates transferred to Conrail in 1976. Because Treasury lends these funds at the current interest rate, the request also includes an appropriation to cover interest that is accruing each day until the notes are repaid.

FEDERAL RAILROAD ADMINISTRATION
SETTLEMENTS OF RAILROAD LITIGATION

NARRATIVE JUSTIFICATION

SUMMARY TABLE
(Dollars in thousands)

	FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
Appropriation			
Budget Authority.........	$226	$265	+$39
Liquidation of Borrowing Authority.............	$...	$3,097	+$3,097
Total appropriation......	**$226**	**$3,362**	**+$3,136**

Background

In 1987, the Government settled on the value of properties transferred to Conrail from the Central Railroad Company of New Jersey Industries (CJI). CJI reimbursed the Government in the amount of $38,950,246 which the FY 1988 Continuing Resolution (P.L. 100-202) authorized FRA to redeem the outstanding promissory note. However, the proceeds were not sufficient to repay Treasury for the capitalized interest. On September 30, 1989, FRA had to incur public debt authority in the amount of $212,637.18 to cover the interest that accrued on the outstanding principal through September 30, 1989. Consequently, the note was rolled-over for one year until September 30, 1990. As a result, FRA will incur public debt authority in the amount of $225,916.37 to cover the interest that will accrue during the period from October 1, 1989 through September 30, 1990.

Detailed Justification

FRA requests an appropriation for the liquidation of borrowing authority, which consists of $2,870,602 in principal and $225,916 in capitalized interest, and for new budget authority for payment of approximately $264,732 in accrued interest for the period from October 1, 1990 through September 30, 1991. The FY 1991 appropriation will avoid incremental borrowing authority in later fiscal years if the interest on the promissory note were continued to be refinanced.

Details of this request are as follows:	($000)
Promissory note as of September 30, 1989	$2,871
Add: Capitalized interest due to "rollover" of note on September 30, 1990	226
Subtotal, appropriation to liquidate debt authority	3,097
Add: Accrued interest requiring a direct appropriation (October 1, 1990 to September 30, 1991)	265
Total: Amount which will be owed to Treasury when note is paid on September 30, 1991 assuming the availability of FY 1991 appropriations	$3,362

[NORTHEAST CORRIDOR IMPROVEMENT PROGRAM]

[For necessary expenses related to Northeast Corridor improvements authorized by Title VII of the Railroad Revitalization and Regulatory Reform Act of 1976, as amended (45 U.S.C. 851 et seq.) and the Rail Safety Improvement Act of 1988, $24,800,000, to remain available until expended.] (Department of Transportation and Related Agencies Appropriations Act, 1990.)

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
NORTHEAST CORRIDOR IMPROVEMENT PROGRAM

Program and Financing (in thousands of dollars)

Identification code 69-0123-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
Direct program:			
00.01 Construction.............	21,184	33,057	...
00.02 System engineering/ program management and administration.......	22	66	...
00.03 Public grade crossing elimination...........	31	7,724	...
00.91 Total direct program...	21,237	40,847	...
01.01 Reimbursable program.....	...	179	...
10.00 Total obligations......	21,237	41,026	...
Financing:			
Offsetting collections from:			
13.00 Trust funds............	...	-5,000	...
14.00 Non-Federal sources....	...	-179	...
17.00 Recovery of prior year obligations...........	-1,194	...	...
21.40 Unobligated balance available, start of year................	-11,848	-11,405	...
24.40 Unobligated balance available, end of year.	11,405	...	...
39.00 Budget authority.....	19,600	24,442	...
Budget authority:			
40.00 Appropriation...........	19,600	24,800	...
40.00 Reduction pursuant to P.L. 101-164..........	...	-74	...
40.00 Reduction pursuant to P.L. 99-177...........	...	-284	...
43.00 Appropriation (adjusted).........	19,600	24,442	...
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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
NORTHEAST CORRIDOR IMPROVEMENT PROGRAM

Program and Financing (in thousands of dollars)

Identification code 69-0123-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Relation of obligations to outlays:			
71.00 Obligations incurred, net....................	21,237	35,847	...
72.40 Obligated balance, start of year...............	109,275	87,881	81,111
74.40 Obligated balance, end of year...............	-87,881	-81,111	-37,118
78.00 Adjustments in unexpired accounts.............	-1,194	...	...
90.00 Outlays...............	41,438	42,617	43,993
(Memo cnt: 21.8)	(Memo cnt: 8)	(Memo cnt: 8)	(Memo cnt: 4.8)

NORTHEAST CORRIDOR IMPROVEMENT PROGRAM

PROGRAM AND PERFORMANCE

No funds are requested for this program in 1991. At the end of 1985, responsibility for any additional construction on the Northeast Corridor was transferred to the National Railroad Passenger Corporation (Amtrak). Obligations and outlays will continue on projects included in prior year appropriations.

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DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
NORTHEAST CORRIDOR IMPROVEMENT PROGRAM

OBJECT CLASSIFICATION (in thousands of dollars)

Identification code 69-0123-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
FEDERAL RAILROAD ADMINISTRATION			
25.0 Direct obligations: Other services..............	21,206	33,123	...
99.0 Reimbursable obligations: Federal Railroad Administration........	...	179	...
ALLOCATION TO FEDERAL HIGHWAY ADMINISTRATION			
25.0 Other services...........	31	7,724	...
99.0 Subtotal obligations, Federal Highway Administration............	31	7,724	...
99.9 Total obligations........	21,237	41,026	...

[GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION]

[To enable the Secretary of Transportation to make grants to the National Railroad Passenger Corporation for operating losses incurred by the Corporation, capital improvements, and labor protection costs authorized by 45 U.S.C. 565, to remain available until expended, $615,000,000, of which $530,000,000 shall be available for operating losses incurred by the Corporation and for labor protection costs, and of which $85,000,000 shall be available for capital improvements. Funds made available for operating losses and for labor protection costs which remain unobligated as of September 30, 1990, may be available for capital improvements: **Provided**, That none of the funds herein appropriated shall be used for lease or purchase of passenger motor vehicles or for the hire of vehicle operators for any officer or employee, other than the president of the Corporation, excluding the lease of passenger motor vehicles for those officers or employees while in official travel status: **Provided further**, That the Secretary shall make no commitments to guarantee new loans or loans for new purposes under 45 U.S.C. 602 in fiscal year 1990: **Provided further**, That the incurring of any obligation or commitment by the Corporation for the purchase of capital improvements prohibited by this Act or not expressly provided for in an appropriations Act shall be deemed a violation of 31 U.S.C. 1341: **Provided further**, That no funds are required to be expended or reserved for expenditure pursuant to 45 U.S.C. 601(e): **Provided further**, That none of the funds in this or any other Act shall be made available to finance the rehabilitation and other improvements (including upgrading track and the signal system, ensuring safety at public and private highway and pedestrian crossings by improving signals or eliminating such crossings, and the improvement of operational portions of stations related to intercity rail passenger service) on the main line track between Atlantic City, New Jersey, and the main line of the Northeast Corridor, unless the Secretary of Transportation certifies that not less than 40 per centum of the costs of such improvements shall be derived from non-Federal sources: **Provided further**, That, notwithstanding any other provision of law, the National Railroad Passenger Corporation shall not operate rail passenger service between Atlantic City, New Jersey, and the Northeast Corridor main line unless the Corporation's Board of Directors determines that revenues from such service have covered or exceeded 80 per centum of the short-term avoidable costs of operating such service in the second year of operation and 100 per centum of the short-term avoidable operating costs for each year thereafter: **Provided further**, That none of the funds provided in this or any other Act shall be made available to finance the acquisition and rehabilitation of a line, and construction necessary to facilitate improved rail passenger service, between Spuyten

Duyvil, New York, and the main line of the Northeast Corridor unless the Secretary of Transportation certifies that not less than 40 per centum of the costs of such improvements shall be derived from non-Amtrak sources.] (Department of Transportation and Related Agencies Appropriations Act, 1990.)

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION

Program and Financing (in thousands of dollars)

Identification code 69-0704-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
00.01 Operating grants.........	553,600	521,111	...
00.02 Labor protection and capital grants.........	20,700	126,862	...
10.00 Total obligations (object class 41.0)..	574,300	647,973	...
Financing:			
21.40 Unobligated balance available, start of year.................	-37,588	-43,288	...
22.40 Unobligated balance transferred, net.......	4,000	...	...
24.40 Unobligated balance available, end of year.	43,288	...	...
39.00 Budget authority.........	584,000	604,685	...
Budget authority:			
40.00 Appropriation............	584,000	615,000	...
40.00 Reduction pursuant to P.L. 101-164...........	...	-1,845	...
40.00 Reduction pursuant to P.L. 99-177............	...	-8,470	...
43.00 Appropriation (adjusted).........	584,000	604,685	...
Relation of obligations to outlays:			
71.00 Obligations incurred, net....................	574,300	647,973	...
72.40 Obligated balance, start of year................	340	241	69,774
74.40 Obligated balance, end of year................	-241	-69,774	...
90.00 Outlays...............	574,399	578,440	69,774
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GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION

PROGRAM AND PERFORMANCE

Amtrak has made significant progress over the past several years in increasing its revenue-to-cost ratio. Although Amtrak's objective is to eliminate the need for Federal operating subsidies by the year 2000, current budget constraints limit the availability of funds for Amtrak's present subsidy needs. Accordingly, no Federal subsidy is proposed for 1991. The Administration is eager to work with the Congress, Amtrak, and other interested public and private parties to determine how best to obtain needed capital from the private sector and to make Amtrak services more cost-effective.

FEDERAL RAILROAD ADMINISTRATION
GRANTS TO THE NATIONAL RAILROAD PASSENGER CORPORATION (AMTRAK)

NARRATIVE JUSTIFICATION

The Federal role in this program is to provide a means for channeling appropriated operating, capital and labor protection grants to the National Railroad Passenger Corporation (Amtrak). The authority to fulfill this role is Section 601 of the Rail Passenger Service Act, as amended. The Administration proposes to discontinue all such grants beginning in FY 1991.

SUMMARY TABLE
(Dollars in thousands)

	FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
Budget Authority (Program Level)	**$604,685**	**$ ...**	**-$604,685**

ADJUSTMENTS TO BASE AND PROGRAM CHANGES

	Program Level	Authorized Positions	FTEs
FY 1990 Base	$604,685	...	...
Adjustments to Base:			
Subtotal, Adjustments to Base	...	...	...
Program Changes:			
o Operating Grants and State Assisted Routes	-519,111	...	...
o Labor Protection and Capital Grants	- 85,574	...	...
Subtotal, Program Changes	-604,685	...	...
Subtotal, Increases or Decreases . . .	-604,685	...	...
Total FY 1991 Request	...	...	...

EXPLANATION OF CHANGES:

Program Changes. . . . . -$604,685

- Operating Grants and State Assisted Routes . . . -$519,111

  No new budget authority is being requested for Fiscal Year 1991.

- Labor Protection and Capital Grants . . . . -$ 85,574

  No new budget authority is being requested for Fiscal Year 1991.

  If subsidy termination results in an Amtrak bankruptcy, labor protection costs would be funded out of the liquidation of Corporate assets. Labor protection would be a liability of the bankrupt estate and not the Federal Government.

[AMTRAK CORRIDOR IMPROVEMENT LOANS]

[The Secretary is authorized to provide $3,500,000 in loans to the Chicago, Missouri and Western Railroad, or its successors, to replace existing jointed rail with continuous welded rail between Joliet, Illinois and Granite City, Illinois: **Provided**, That any loan authorized under this section shall be structured with a maximum 20 year payment at an annual interest rate of 4 per centum: **Provided further**, That the Federal Government shall hold a first and prior purchase money security interest with respect to any materials to be acquired with Federal funds: **Provided further**, That any such loan shall be matched on a dollar for dollar basis by the State of Illinois.] (Department of Transportation and Related Agencies Appropriations Act, 1990.)

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DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
AMTRAK CORRIDOR IMPROVEMENT LOANS

Program and Financing (in thousands of dollars)

Identification code 69-0720-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
00.01 Amtrak corridor improvement loans......	...	3,490	...
10.00 Total obligations......	...	3,490	...
Financing:			
39.00 Budget authority.........	...	3,490	...
Budget authority:			
40.00 Appropriation............	...	3,500	...
40.00 Reduction pursuant to P.L. 101-164...........	...	-10	...
43.00 Appropriation (adjusted).............	...	3,490	...
Relation of obligations to outlays:			
71.00 Obligations incurred, net	...	3,490	...
72.40 Obligated balance, start of year................	...	...	1,745
74.40 Obligated balance, end of year..................	...	-1,745	...
90.00 Outlays.............	...	1,745	1,745
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DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
AMTRAK CORRIDOR IMPROVEMENT LOANS

Alaska Railroad Revolving Fund

Status of Direct Loans (in thousands of dollars)

Identification code 69-0720-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Position with respect to appropriation act limitation on obligations:			
1111 Limitation of direct loans................	...	3,500	...
1111 Reduction pursuant to P.L. 101-164.........	...	-10	...
1150 Total direct loan obligations.......	...	3,490	...
Cumulative balance of direct loans outstanding:			
1210 Outstanding, start of year.................	...	...	1,745
1231 Disbusements: Direct loan disbursements...	...	1,745	1,745
1290 Outstanding, end of year.................	...	1,745	3,490

AMTRAK CORRIDOR IMPROVEMENT LOANS

PROGRAM AND PERFORMANCE

Amtrak corridor improvement loans.--In 1990, loan funds were provided for the Chicago, Missouri and Western Railroad, or its successors, to replace jointed rail with continuous welded rail between Joliet and Granite City, Illinois. No funds are requested for this program in 1991.

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DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
ALASKA RAILROAD REVOLVING FUND

Program and Financing (in thousands of dollars)

Identification code 69-4400-0-3-401	19 89 actual	19 90 estimate	19 91 estimate
Relation of obligations to outlays:			
71.00 Obligations incurred, net....................	...	...	...
72.90 Obligated balance, start of year: Fund balance.	562	239	...
74.90 Obligated balance, end of year: Fund balance....	-239	...	...
90.00 Outlays............	322	239	...

ALASKA RAILROAD REVOLVING FUND

PROGRAM AND PERFORMANCE

The Alaska Railroad was operated by the Federal Government under the Act of March 12, 1914 (38 Stat. 305).

The Alaska Transfer Act of 1982 authorized transfer of the Alaska Railroad to the State of Alaska. The transfer was accomplished January 5, 1985.

REGIONAL RAIL REORGANIZATION PROGRAM

For the settlement of promissory notes pursuant to Section 210 of the Regional Rail Reorganization Act of 1973 (Public Law 93-236), as amended, [$94,932,979] $284,979, to remain available until expended, together with such sums as may be necessary for the payment of interest due to the Secretary of the Treasury under the terms and conditions of such notes. (Department of Transportation and Related Agencies Appropriations Act, 1990.)

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DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
REGIONAL RAIL REORGANIZATION PROGRAM

Program and Financing (in thousands of dollars)

Identification code 69-4100-0-3-401	19 actual 89	19 estimate 90	19 estimate 91
Program by activities:			
10.00 Total obligations (object class 43.0)..	...	9,862	23
Financing:			
39.00 Budget authority........	...	9,862	23
Budget authority:			
Current:			
40.00 Appropriation (definite)............	...	94,933	308
40.00 Appropriation (indefinite)..........	...	9,577	...
40.00 Reduction pursuant to P.L. 101-164..........	...	-285	...
40.47 Portion applied to debt reduction.............	...	-94,648	-285
43.00 Appropriation (adjusted)........	...	9,577	23
Permanent:			
67.10 Authority to borrow (permanent, indefinite)	...	285	...
Relation of obligations to outlays:			
71.00 Obligations incurred, net....................	...	9,862	23
90.00 Outlays	...	9,862	23
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REGIONAL RAIL REORGANIZATION PROGRAM

PROGRAM AND PERFORMANCE

The United States Railway Association was authorized by the Regional Rail Reorganization Act, as amended, to borrow funds and make loans to certain railroads. These borrowings were guaranteed by the Secretary of Transportation and are limited to an aggregate of outstanding obligations of $395 million. Outstanding loans payable were transferred to the Department of Transportation on January 1, 1987. In 1990, an appropriation to liquidate $95 million of principal and $9,577 thousand in accrued interest was enacted. Due to the 1990 drug program offset, the 1990 appropriation was reduced by $285 thousand. In order to close out this account, an appropriation to liquidate principal plus interest is requested in 1991.

FEDERAL RAILROAD ADMINISTRATION
REGIONAL RAIL REORGANIZATION

NARRATIVE JUSTIFICATION

SUMMARY TABLE
(Dollars in thousands)

	FY 1990	FY 1991	FY 1991 over (+) or under (-) FY 1990
Appropriation			
Budget Authority.........	$9,862	$23	-$9,839
Liquidation of Borrowing Authority..............	$94,648	285	-$94,363
Total appropriation......	**$104,510**	**$308**	**-$104,202**

Background

On January 1, 1987, the United States Railway Association (USRA) was abolished and its outstanding loan payable to the U.S. Treasury was transferred to the Department of Transportation. On September 30, 1988, the Federal Railroad Administration rolled-over the outstanding note. The FY 1990 Appropriation Act (P.L. 101-164) reduced the request to pay off the principal of $94,932,979 by $284,979 because of the emergency drug funding offset. Therefore, the balance of the note will be rolled-over on December 31, 1989. Congress provided an appropriation to liquidate the accrued interest on the note to December 31, 1989. FRA will incur public debt authority in the amount of $284,979 to cover the reduced amount of the principal.

Detailed Justification

FRA requests an appropriation for the liquidation of borrowing authority, which consists of $284,979 in principal and for new budget authority for payment of approximately $22,798 in accrued interest for the period from October 1, 1990 through September 30, 1991. However, the interest payment may be reduced if the 1991 appropriation is enacted before September 30, 1991 allowing the interest to be paid more quickly. The FY 1991 appropriation will avoid incremental borrowing authority in later fiscal years.

Details of this request are as follows:	($000)
Promissory note as of September 30, 1990..............	$285
Add: Accrued interest requiring a direct appropriation (October 1, 1990 to September 30, 1991)................................	23
Total: Amount which will be owed to Treasury when note is paid on September 30, 1991, assuming the availability of FY 1991 appropriations..........	$308

RAILROAD REHABILITATION AND IMPROVEMENT FINANCING FUNDS

The Secretary of Transportation is authorized to issue to the Secretary of the Treasury notes or other obligations pursuant to section 512 of the Railroad Revitalization and Regulatory Reform Act of 1976 (Public Law 94-210), as amended, in such amounts and at such times as may be necessary to pay any amounts required pursuant to the guarantee of the principal amount of obligations under sections 511 through 513 of such Act, such authority to exist as long as any such guaranteed obligation is outstanding: **Provided**, That no new loan guarantee commitments shall be made during fiscal year [1990] 1991: **Provided further**, That, notwithstanding any other provision of law, the Secretary of Transportation [shall] is authorized to sell securities or promissory notes [with a principal value of at least $50,000,000] that are held by the Department of Transportation under authority of sections 502, 505-507, 509, and 511-513 of the Railroad Revitalization and Regulatory Reform Act of 1976 (Public Law 94-210), as amended, [by no later than] through September 30, [1990] 1991: **Provided further**, That such securities or promissory notes authorized to be sold in the immediately preceding proviso shall be sold only for amounts greater than or equal to the net present value to the Government of each loan as determined by the Secretary of Transportation in consultation with the Secretary of the Treasury: **Provided further**, That the Secretary of Transportation shall transmit a written certification to the Committees on Appropriations of the Senate and House of Representatives [before the consummation of each sale] certifying that the amount to be realized is equal to or greater than the net present value to the Government of each loan: [**Provided further**, That notwithstanding any other provision of law, for fiscal year 1989 and each fiscal year thereafter all amounts realized from the sale of notes or securities sold under authority of this section shall be considered as current year domestic discretionary outlay offsets and not as "asset sales" or "loan prepayments" as defined by section 257(12) of the Balanced Budget and Emergency Deficit Control Act of 1985, as amended:] **Provided further**, That any underwriting fees and related expenses shall be derived solely from the proceeds of the sales. (Department of Transportation and Related Agencies Appropriations Act, 1990.)

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300-101

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
RAILROAD REHABILITATION AND IMPROVEMENT FINANCING FUNDS

Program and Financing (in thousands of dollars)

Identification code 69-4411-0-3-401	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
00.01 Loan repayments..........	2,450	3,220	1,846
10.00 Total obligations (object class 33.0)............	2,450	3,220	1,846
Financing:			
Offsetting collections from Non-Federal Sources:			
14.00 Fees, interest and repayments..........	-16,139	-3,282	-1,898
14.00 Sale of assets........	-82,979	-137,200	-18,000
Unobligated balance available, start of year:			
21.90 Treasury balance........	-7	-2	...
21.91 U.S. securities (par)...	-305	-435	-499
Unobligated balance available, end of year:			
24.90 Treasury balance........	2	...	...
24.91 U.S. securities (par)...	435	499	551
31.00 Redemption of debt......	96,544	137,200	18,000
39.00 Budget authority....	...	...	...
Relation of obligations to outlays:			
71.00 Obligations incurred, net..................	-96,668	-137,262	-18,052
72.47 Obligated balance, start of year: Authority to borrow...............	32,439	18,749	5,749
74.47 Obligated balance, end of year: Authority to borrow..............	-18,749	-5,749	-...
77.00 Adjustments in expired accounts............	-4,070	...	...
90.00 Outlays...........	-87,048	-124,262	-12,303
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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION
RAILROAD REHABILITATION AND IMPROVEMENT FINANCING FUNDS

Status of Direct Loans (in thousands of dollars)

69-4411-0-3-401	19 89 actual	19 90 estimate	19 91 estimate
Cumulative balance of direct loans outstanding:			
1210 Outstanding, start of year..................	462,462	372,462	136,342
1231 Disbursements: Direct loan disbursements....	9,620	5,000	1,800
Repayments:			
1251 Repayments and prepayments.........	-2,450	-3,220	-1,846
1253 Proceeds from loan asset sales to the public or discounted prepayments without recourse....	-82,979	-137,200	-18,000
1263 Adjustments: Discount on loan asset sales to the public or discounted prepayments...........	-14,191	-100,700	-38,734
1290 Outstanding, end of year..	372,462	136,342	79,562

RAILROAD REHABILITATION AND IMPROVEMENT FINANCING FUNDS

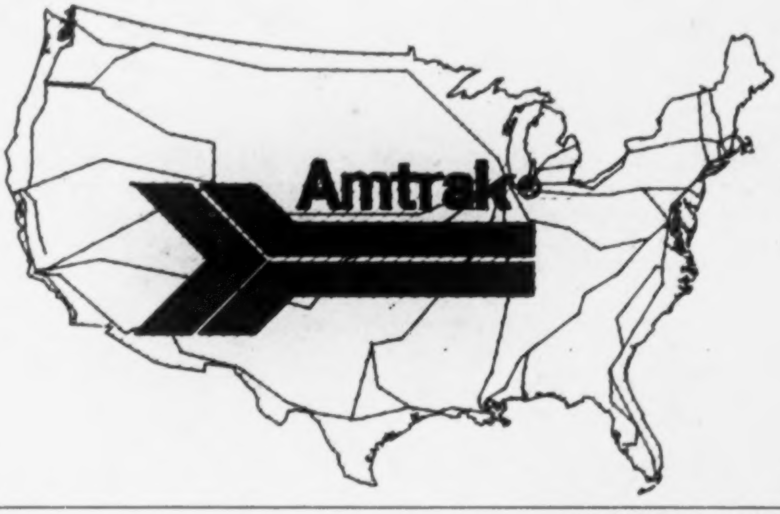
PROGRAM AND PERFORMANCE

Redeemable preference shares.-Authority for the section 505 redeemable preference shares program expired on September 30, 1988, and no new commitments will be made in the section 511 loan guarantee program in 1990 and 1991. However, outlays will continue on section 505 projects included in prior year appropriations. This account now reflects direct loans which were previously shown under the Federal Financing Bank direct loan account. This account also reflects receipts of $92.6 million for principal and interest in 1989, $137 million in 1990, and $18 million in 1991 resulting from the sale of redeemable preference shares to the private sector.

Loan repayments.-This program reflects repayments of principal and interest on outstanding borrowings by the railroads to the Federal Financing Bank.

NATIONAL RAILROAD PASSENGER CORPORATION

FISCAL YEAR 1991
GRANT REQUEST
&
JUSTIFICATION



FEBRUARY 9, 1990

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 BUDGET JUSTIFICATION

Amtrak requests an FY91 grant of $684.0 million to continue operation of its existing national system, provide a portion of the funding required for current critical capital needs and a major equipment order to provide much needed capacity, and to allow for the continued reduction of federal support for operations.

Grant Required for Amtrak Operations — $279

Operation of the national system in FY91 will require $279 million of grant funding to supplement an estimated $1,440 million of revenues available for intercity passenger operations. Additionally, Amtrak has provided commuter service under contract with the Maryland Department of Transportation for over seven years, with the Massachusetts Bay Transit Authority (MBTA) since January 1, 1987, and beginning in FY90, with the Connecticut Department of Transportation. As these services produce revenues that fully cover their costs, this funding request does not include any Federal support for the operations of these commuter services.

Grant Required to Benefit Obligatory Non-Amtrak Programs — $216 million

Funding of $216 million is required in FY91 to support Federally-mandated Amtrak payments that do not contribute to Amtrak's mission of providing intercity rail passenger service:

	($Millions)
excess Railroad Retirement Taxes	$135
excess Railroad Unemployment Insurance	17
excess Claims costs due to FELA	17
pass through funding for NEC Commuter Opns.	47
	$216

Capital — $188 million

Amtrak's FY91 capital needs total $500 million. Of this total, $37 million can be financed from self generated sources such as the Revenue Enhancement programs, and $275 million through private financing. The remainder requires federal capital support in the amount of $188 million. Of this amount, $105 million in federal funds and $275 million in private financing is designated for equipment acquisition.

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 BUDGET JUSTIFICATION

Labor Protection — $1 million

This estimate covers payments required by law and contracts to employees who have been adversely affected by service changes.

Budget Uncertainties

Amtrak's principal FY91 budget uncertainties are:

- The financial impact of contract negotiations with railroad labor which have been in progress since July 1, 1988. Employee demands aggregate to over $150 million per year above current levels, with denial of any work rule changes to improve productivity.
- The possibility that the Commission on Railroad Retirement Reform could – but reportedly will not recommend changes that will further burden Amtrak unfairly.
- The substantial financial impact of pending legislation and state legal actions relating to the release of wastes en route from Amtrak's long distance cars.

NECIP

Amtrak requests an FY91 NECIP grant of $58.8 million to continue vital capital improvements to the Northeast Corridor. This is actually less than the depreciation that will accrue on NEC property in 1991. These high priority projects involve operational improvements and safety enhancements to the railroad.

NATIONAL RAILROAD PASSENGER CORPORATION
OPERATING EXPENSE COMPARISON
($ Millions)

	FY90 Budget	FY91 Estimate
Revenue Available for Operations	1,316	1,440
Funded Amtrak Expense	1,633	1,719
Grant Required for Amtrak Operations	317	279
Grant Required to Benefit Presently Obligatory Non-Amtrak Programs*	202	216
Total Operating Grant	519	495
Revenue to Cost Ratio	0.75	0.78
Revenue to Cost Ratio If Non-Amtrak Requirements Were Removed	0.84	0.87
Grant Summary		
Amtrak Operations	317	279
Labor Protection	2	1
Capital Investment	84	188
Grant used to Benefit Presently Obligatory Non-Amtrak Programs*	202	216
Total Grant	605	684

*Impact of RRTA, RUIA and FELA in excess of actual liability or State Worker's Compensation and pass through for NEC Commuter Operations.

NATIONAL RAILROAD PASSENGER CORPORATION
OPERATING EXPENSE COMPARISON
(\$ Millions)

Operating Expenses	FY90 Budget	FY91 Grant Estimate
Train Operations	425.6	429.9
Maintenance of Equipment	439.2	444.9
Maintenance of Way	214.8	215.5
On-Board Services	167.1	172.5
Station Services	117.8	120.1
Marketing & Reservations	186.2	187.3
General Support	141.3	140.1
Insurance & Interest	101.6	106.4
Depreciation	176.1	180.1
General and Administrative	43.0	42.6
Total Operating Expense	2,012.7	2,039.4
Provision for Inflation Increase	0.0	76.6
Total Expense	2,012.7	2,116.0
Less:		
Cost of Obligatory Non-Amtrak Programs*	202.0	216.0
Expenses Not Requiring Appropriations	178.1	181.0
Funded Amtrak Expenses	1,632.6	1,719.0
Total Revenue	1,371.7	1,500.0
Less:		
Restricted Revenue	56.2	60.0
Revenue Available for Operations	1,315.5	1,440.0
Grant Requirement for Amtrak Operations	317.1	279.0
Revenue to Cost Ratio	0.75	0.78
Summary of Grant Request		
Amtrak Operations	317.1	279.0
Labor Protection	2.0	1.0
Capital	83.6	188.0
Grant used to Benefit Obligatory Non-Amtrak Programs*	202.0	216.0
Total Grant	604.7	684.0

*Impact of RRTA, RUIA and FELA in excess of actual liability or State Worker's Compensation and pass through for NEC Commuter Operations.

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 BUDGET JUSTIFICATION

($ Millions)

Grant Required to Benefit Obligatory Non-Amtrak Programs
Operating Expenses

Estimate FY 90	Estimate FY 91	Change
$ 202.0	$ 216.0	$ 14.0

This funding is required to support federally-mandated programs, under which Amtrak annually must contribute to the Railroad Retirement trust fund and the Railroad Unemployment trust fund amounts far in excess of Amtrak's liability for benefits to its retirees and other beneficiaries, as well as to pay the high cost of resolving employee injury claims under the Federal Employers' Liability Act, which costs could be significantly reduced under the more equitable and no-fault state workers' compensation laws.

o Railroad Retirement - $135 Million

Current law requires that Amtrak and its employees pay Tier II and supplemental taxes that will total an estimated $179 million in FY91.

Benefits to individuals who retired from Amtrak and to their beneficiaries will not exceed $44 million, leaving an excess payment or subsidy to the freight railroad industry of $135 million.

This appears as an Amtrak expense and operating subsidy but does not contribute to the provision of intercity rail passenger service.

Although this amount appears as a federal subsidy to Amtrak, in accordance with current budget practice this excess is reported in the federal budget as income and results in no net outlay of federal funds.

o Railroad Unemployment - $17 Million

Current law requires Amtrak to annually pay an estimated $8 million in excess of its fair share into the Railroad Unemployment Fund. In addition, the law requires Amtrak to pay $9 million per year of repayment tax. Both amounts represent excess payments by Amtrak to the federal government which result in no net outlay of federal funds and in effect constitute a subsidy to the freight railroads.

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 BUDGET JUSTIFICATION

($ Millions)

Grant Required to Benefit Obligatory Non-Amtrak Programs
Operating Expenses

o F.E.L.A. - $17 Million

It is estimated that $17 million in F.E.L.A. payments and litigation costs would be saved under state workers' compensation programs. Much of this amount currently benefits F.E.L.A. attorneys, whose compensation runs from 25% to 40% of the settlement.

o Commuter Operations Support - $47 Million

Amtrak's proposed federal operating grant includes $47 million to support the fully allocated cost of operations by state commuter railroads on the Northeast Corridor. State commuter railroads presently are required under ICC cost allocation rules to reimburse Amtrak for only the incremental cost of their operations, whereas Amtrak, as owner, must absorb the remaining cost of maintaining and operating the Corridor for intercity, commuter and freight rail service. This subsidy for commuter operations should be provided as a special grant to Amtrak for support of mass transit operations on Amtrak's track and not be treated as a cost of providing intercity rail passenger service.

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 BUDGET JUSTIFICATION

($ Millions)

TRAIN OPERATIONS
Operating Expenses

Budget FY 90	Estimate FY 91	Change
$ 425.6	$ 429.9	$ 4.3

This program includes the costs of the engineers and conductors who actually work on the train as well as the fuel and electricity required to run the train.

It also includes the cost incurred at terminals, plus the costs of all operational communications and train control.

Approximately 10% of this amount will be paid in FY91 to 20 railroads for services provided for the operation of trains for Amtrak. The remainder covers approximately 4,500 personnel involved in direct Amtrak operations and Amtrak's operation of contractual commuter service for Maryland, Massachusetts and Connecticut. The current work force consists of approximately 2,150 Trainmen, 1,250 Enginemen, 500 managerial, supervisory clerical staff, and over 650 personnel involved in other transportation functions, such as block and tower operations, dispatching and train control.

Amtrak currently operates approximately 250 trains on a national system of over 24,000 route miles. This includes 600 miles in the Northeast Corridor and over 200 off-corridor miles owned by Amtrak. This system provides service to approximately 500 towns and cities.

The forecasted increase of $4.3 million primarily reflects the impact of new services, which include increased state supported service in California, and North Carolina, re-routing of the Empire Service via the Westside Connection and added Washington-Newport News Service, offset by productivity savings as a result of more efficient scheduling of operating crews.

Costs are in constant FY90 dollars. The estimated FY91 inflation rate is explained on page 18.

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NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 BUDGET JUSTIFICATION

($ Millions)

MAINTENANCE OF EQUIPMENT
Operating Expenses

Budget FY 90	Estimate FY 91	Change
$ 439.2	$ 444.9	$ 5.7

The Maintenance of Equipment program provides for routine maintenance and cleaning at the end of each trip, preventive maintenance programs, overhauls and equipment conversions, and maintenance provided under contract to commuter agencies. Direct employment levels are expected to be approximately 6,400. This covers approximately 5,900 personnel involved in direct Amtrak operations and an additional 500 personnel related to Amtrak's fully reimbursable contract operation of commuter services for Maryland, Massachusetts, and Connecticut.

Amtrak has stepped up the rate and scope of overhauls and preventive maintenance of cars and locomotives by using new and more efficient production line techniques in maintenance facilities across the system. As a result, by September 1989, only five (5) passenger cars were overdue for 120-day preventive maintenance as compared to 505 in September 1988. The heavy overhaul goal for FY91 is 410 units, consisting of 335 cars (Amfleet, Superliners and Heritage) and 75 locomotives (20 electric and 55 diesel).

The $5.7 million forecasted increase primarily reflects the cost of new services, which include added state-supported services in California, and North Carolina, added Washington-Newport News Service, re-routing of the Empire Service via the Westside Connection, and expanded MBTA commuter service which is fully funded by the state and does not require any federal funds.

Costs are in constant FY90 dollars. The estimated FY91 inflation rate is explained on page 18.

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 BUDGET JUSTIFICATION

($ Millions)

MAINTENANCE OF WAY
Operating Expenses

Budget FY 90	Estimate FY 91	Change
$ 214.8	$ 215.5	$ 0.7

The Maintenance of Way Program includes maintenance of track, communications and signal systems, electrification systems, buildings, tunnels, and all other roadway properties under Amtrak's ownership. Direct employment is expected to be approximately 3,300. This includes both personnel related to Amtrak's operations and the operations under commuter service agreements. This program also includes payments to operating railroads for similar costs.

The major part of Maintenance of Way expense is incurred on Amtrak's owned property in the Northeast Corridor. An estimated 7% covers payment to freight railroads for use of their track. The remainder covers Amtrak-owned track in New York and Michigan and yards in Louisiana, California, Illinois and Florida, and $46 million in fully reimbursable maintenance provided under contractual agreements with various state and commuter agencies.

Amtrak is continuing to work on a priority basis to improve and, where feasible, eliminate grade crossings in order to reduce crossing accidents. Programs to maintain and improve ride quality testing, improve interlockings and monitor performance of our high speed surfacing gangs are also being continued. Amtrak is currently engaged in a joint program with the Counties of Los Angeles, Orange and San Diego, Santa Fe Railway and the State of California to replace worn out jointed rail with new welded rail, and improve signaling and grade crossings on the Los Angeles-San Diego Rail Corridor. This program is anticipated to continue through FY91.

The $.7 million increase in Maintenance of Way expenditures is primarily due to the impact of the completion of the Westside Connection project and other maintenance requirements as a result of new services.

Costs are in constant FY90 dollars. The estimated FY91 inflation rate is explained on page 18.

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 BUDGET JUSTIFICATION

($ Millions)

ON-BOARD SERVICES
Operating Expenses

Budget FY 90	Estimate FY 91	Change
$ 167.1	$ 172.5	$ 5.4

This program provides service to passengers on the train. It includes the operation of 325 food service cars, such as diners, dinettes, buffet cars, and snack cars, as well as coaches, sleepers, 17 commissaries and several facilities for crew layover.

Labor, including benefits, accounts for 70% of the program cost with the remainder covering food, beverages, and supplies. Approximately 3,000 personnel are employed in the program.

Program costs for FY91 are estimated as follows:

	Labor	Other	Total
Food and Beverage Service	$64.2	$46.1	$110.3
Coach Service	21.2	2.5	23.7
Sleeping Car Service	12.4	3.3	15.7
Other On-Board Support	19.5	3.3	22.8
Total	$117.3	$55.2	$172.5

The overall change includes increased costs associated with service changes, state-supported service in North Carolina and California, Washington to Newport News Service, the re-routing of the Empire Service over the Westside Connection and projected increased food sales of approximately $2.9 million.

Costs are in constant FY90 dollars. The estimated FY91 inflation rate is explained on page 18.

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 BUDGET JUSTIFICATION

($ Millions)

STATIONS
Operating Expenses

Budget FY 90	Estimate FY 91	Change
$ 117.8	$ 120.1	$ 2.3

This program encompasses the operation of stations and includes ticketing, baggage and express handling. All expenses of station operation such as labor, rent, utilities and routine maintenance are also included.

The proposed FY91 route structure assumes operation of approximately 504 manned and unmanned stations. Of these, 83 are owned by Amtrak, and 421 are owned by other railroads, cities or private interests.

Amtrak employs approximately 2,200 people for various levels of services at our 232 manned stations. Employment levels for the major functions are:

Ticketing	1050
Mail, Baggage & Express	475
Station Opns. & Maintenance	300
Other Station Personnel	245
Managerial & Support	130
Total	2200

Railroad personnel provide service at 20 other stations; Amtrak trains stop at an additional 252 locations.

The magnificent redevelopment of Washington Union Station and the positive public response testify to Amtrak's commitment to improve passenger facilities. Efforts are underway to transform other Amtrak stations (Chicago, Philadelphia, New York) into equally modern and efficient facilities.

The overall change includes increased costs associated with service changes, state-supported service in North Carolina and California, as well as expanded Washington to Newport News service and the re-routing of the Empire Service over the Westside Connection.

Costs are in constant FY90 dollars. The estimated FY91 inflation rate is explained on page 18.

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 BUDGET JUSTIFICATION

($ Millions)

MARKETING & RESERVATIONS
Operating Expenses

Budget FY 90	Estimate FY 91	Change
$ 186.2	$ 187.3	$ 1.1

This program includes Amtrak's use of various Marketing and Sales elements to create and enhance our products and services to increase our overall consumer awareness and demand. The elements include advertising, sales promotion, product design and packaging, pricing, distribution, reservations, sales and sales development. Approximately 1,500 personnel are employed to perform these functions.

The Advertising and Sales Promotion Programs are important to expand, enhance and strengthen the ever increasing popularity of passenger rail travel. The advertised message presented to the consumer through the various mediums helps Amtrak to maintain its posture in the marketplace and support the revenue objectives in a very competitive environment. Our sales promotion capabilities permit us to target messages through selected media and to offer special incentives to the consumer or the sales agent in order to stimulate sales of particular products at specific times. For the past few years, Amtrak has been able to increase its revenue at rates above those of the domestic airline industry.

During FY90 Amtrak expects to handle over 35 million calls through our reservation sales systems. The ability to convert incoming telephone inquiries into sales by providing a superior quality telephone sales service is foremost in our Marketing plan. This is accomplished at our three reservation offices in Fort Washington, PA; Chicago, IL; and Los Angeles, CA; and through our automated call response system. The FY91 call volume is expected to increase about 3% over FY90.

The overall change includes costs associated with increased advertising due to new service and anticipated call volume increases for service changes, state-supported service in North Carolina and California, Washington to Newport News Service and the re-routing of the Empire Service over the Westside Connection.

Costs are in constant FY90 dollars. The estimated FY91 inflation rate is explained on page 18.

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 BUDGET JUSTIFICATION

($ Millions)

GENERAL SUPPORT
Operating Expenses

Budget FY 90	Estimate FY 91	Change
$ 141.3	$ 140.1	$ (1.2)

This General Support program includes service and supervisory functions which directly support operations.

The program includes the corporate computer system, revenue accounting, training, audits and criminal investigations, and police activities. In addition it provides for field personnel offices, procurement and material control functions, and the train operations center. Labor and benefits account for 65% of the program with the remainder covering communication costs, rent and utilities, travel, and other office related expenses. Direct employment levels are anticipated to be 1,800, consisting of approximately 800 union and 1,000 nonunion employees. This employment level includes personnel needed to support new state-supported service in North Carolina, and California, re-routing of the Empire service via the Westside Connection and expanded Washington to Newport News service.

The $1.2 million reduction in the General Support program reflects the Corporation's goal to increase productivity through the use of system-wide computer technology utilizing its existing work force.

Costs are in constant FY90 dollars. The estimated FY91 inflation rate is explained on page 18.

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 BUDGET JUSTIFICATION

($ Millions)

INSURANCE & INTEREST
Operating Expenses

Budget FY 90	Estimate FY 91	Change
$ 101.6	$ 106.4	$ 4.8

The program includes expenses for personal liability and property damage insurance and for interest expense.

The forecasted increase of $4.8 million reflects the impact of Amtrak's financing of new equipment, such as the Bombardier "Horizon" Cars as well as costs associated with the Philadelphia 30th Street Station Redevelopment Project.

Costs are in constant FY90 dollars. The estimated FY91 inflation rate is explained on page 18.

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 BUDGET JUSTIFICATION

(\$ Millions)

DEPRECIATION
Operating Expenses

Budget FY 90	Estimate FY 91	Change
\$ 176.1	\$ 180.1	\$ 4.0

Depreciation cost is a direct function of the value and estimated life of depreciable corporate assets. The total expense is a product of asset acquisition cost and depreciation rates which are based on the estimated useful life.

The \$4.0 million increase results from the completion of the upgrade of existing equipment to Push/Pull capability, receipt of new equipment during FY90, and additional capitalization of the Northeast Corridor.

This program requires no cash outlays and therefore does not impact the operating grant requirement.

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 BUDGET JUSTIFICATION

($ Millions)

GENERAL AND ADMINISTRATIVE
Operating Expenses

Budget FY 90	Estimate FY 91	Change
$ 43.0	$ 42.6	$ (0.4)

This program includes the administration and overhead functions of the corporation, the majority of which are performed at corporate headquarters. This represents about 2% of Amtrak total costs.

The program covers the expenses of the Board of Directors, President's Office, Internal Affairs (Office of Inspector General), Corporate Planning, Government Affairs, Corporate Communications, Law, Labor Relations, Headquarters personnel functions and most financial operations. Of the estimated $42.6 million, $18 million is to provide legal and claims support.

The reduction of $0.4 million reflects the corporation's objective to continue the cutback of administrative costs and manpower through technological advancements and employee productivity.

Costs are in constant FY90 dollars. The estimated FY91 inflation rate is explained on page 18.

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 BUDGET JUSTIFICATION

($ Millions)

REVENUE

Budget FY 90	Estimate FY 91	Change
$ 1,371.7	$ 1,500.0	$ 128.3

Fiscal year 1991 revenue is projected to increase $128.3 million (9.4%) over the FY90 level. Most of this increase ($86.1 million or 67%) is in Passenger Related revenue, which is 8.8% greater than FY90. Availability of new equipment for MBTA and mail handling is estimated to increase revenues in these areas by $7.0 million and $9.2 million respectively. In FY91, the Passenger Related revenue increase is attributable to: 1) State supported services in North Carolina and California and new service from Washington to Newport News, and the re-routing of the Empire Service over the Westside Connection; and 2) higher yield due to rate increases. In terms of year-to-year growth, the economy is projected to be relatively stable, resulting in a moderate 4.2% improvement in passenger miles.

	FY 90		FY 91	
	$	% of Total	$	% of Total
Passenger Related	977.6	71.3	1063.7	70.9
MBTA Revenue	82.3	6.0	93.1	6.2
Commuter Operating Payments	75.3	5.5	78.8	5.3
State Payments	13.0	1.0	15.8	1.1
Mail Baggage & Express	42.7	3.1	53.9	3.6
Real Estate & Operations	50.5	3.7	57.3	3.8
Freight	21.3	1.5	22.4	1.5
Interest	28.7	2.1	32.2	2.1
Operations & Mntce. Svcs.	53.1	3.9	55.6	3.7
Miscellaneous	27.2	1.9	27.2	1.8
TOTAL	1,371.7	100.0	1,500.0	100.0

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 BUDGET JUSTIFICATION

($ Millions)

Provision for Inflation Increase
Operating Expenses

Budget FY 90	Estimate FY 91	Change
$ —	$ 76.6	$ 76.6

Amtrak's inflation estimate of 4.4% assumes a slightly higher rate than the Congressional Budget Office's estimate of 4.3%. Existing union labor contracts became eligible for renegotation in July 1, 1988. Any increases resulting from these negotiations which are not offset through workrule negotiations or benefit adjustments will require offsetting program or service related reductions.

NATIONAL RAILROAD PASSENGER CORPORATION FISCAL YEAR 1991 CAPITAL BUDGET JUSTIFICATION

($ MILLIONS)

Amtrak's minimum FY91 capital requirements total $500 million. Of this amount, it is estimated that $37 million can be funded from revenue enhancement sources, and $275 million provided through outside financing, leaving a federal grant requirement of $188 million. Of this amount, $105 million in federal funds and $275 million in private financing is designated for new equipment acquisition. The added capacity provided by the new equipment will generate out- year incremental revenue sufficient to cover operating costs, financing requirements and support the continued reduction of federal funds required for operations.

The projects selected for funding in the proposed FY91 capital plan represent the highest priority requirements from among a list totaling approximately $607 million.

The major programs comprising Amtrak's minimum FY91 capital requirements are:

	($ Millions)	
Rolling Stock	410	
Maintenance Facilities	14	
Right-of-Way	23	
Information & Communication Systems	13	
Stations/On- Board Services	13	
Other (Includes New York Control Center)	26	
Total Capital Requirements		$ 500 *
Less: Revenue enhancement sources		(37)
Outside Financing		(275)
FY91 Capital grant requirement		$ 188

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* Does not add due to rounding.

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 CAPITAL BUDGET JUSTIFICATION

($ MILLIONS)

I. Rolling Stock ($410 Million)

A. New Passenger Car Acquisition - $320 Million

Amtrak's highest priority in the equipment acquisition plan is to purchase new passenger cars to supplement the existing fleet and to replace the aging Heritage cars. Amtrak has identified a need over the next several years for 175 Superliner cars and 307 new Viewliner cars. This request covers an initial order of approximately 115 Superliners. This equipment will provide additional first class capacity to existing trains and will allow for the substitution of higher capacity equipment where possible on Eastern long distance routes, which in turn will provide the Amfleet equipment necessary to convert the last of our tri-weekly trains to daily service.

B. Locomotive Acquisition - $50 Million

Amtrak currently plans to purchase 268 locomotives over the next 10 years as part of the continuing program to replace exhausted, worn out diesel locomotives and provide badly needed motive power. This plan will cover an additional order of approximately 25 new locomotives, including a number of new AC traction prototype locomotives which are more reliable, less costly to maintain and are more fuel efficient than our existing locomotives.

C. Other Equipment - $40 Million

The remaining funds will be used to continue various ongoing equipment programs required to enhance safety, address waste disposal concerns, provide for expanded mail handling service and improve the quality of our service.

II. Maintenance Facilities - $14 Million

Modernization of our maintenance facilities continues to be an important capital requirement. We are continuing projects to allow for more efficient operations at locations such as Beech Grove, Indiana; Bear and Wilmington, Delaware; Sunnyside, New York; Philadelphia, Pennsylvania; Washington, D.C.; and Los Angeles, California.

One of our top priorities is to provide $4 million for facilities at Beech Grove to permit production line type operations. The proposed FY91 funding will be used for airbrake and wheel shop improvements and electrical distribution.

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 CAPITAL BUDGET JUSTIFICATION

($ MILLIONS)

The plan will provide $3.0 million to improve safety and environmental conditions at such locations as Sunnyside Yard, and Philadelphia 30th Street Station. In addition to environmental cleanup at those locations, Amtrak plans to undertake a $1.2 million program at a number of facilities throughout the country to remove unused underground storage tanks, to dispose of the tanks, and their contents, as well as any contaminated soil.

III. Right-of-Way - $23 Million

A. This program will insure the continued safe operation of high speed trains on the Northeast Corridor. In FY91, these projects will include replacing approximately 90,000 ties, undercutting to improve drainage, renewing approximately 10 undergrade bridges, renewal of switch timbers at various interlockings, and replacement of one interlocking on the Harrisburg Line with a modern all-relay interlocking.

This amount also includes Amtrak's final contribution of $1.3 million to a joint project with the State of California and the counties of Los Angeles, Orange and San Diego as well as the Santa Fe Railroad, on the Los Angeles - San Diego route. Most of the old worn jointed rail is being replaced between Fullerton and San Diego at a total cost of approximately $45 million. This project is being phased over four years. Amtrak committed to a 10 percent share of the overall project, or approximately $4.5 million.

B. Funding of $2.0 million will also be provided to begin the replacement of the aerial pole line on the Boston Division with buried cable. Approximately 44 miles will be completed in FY91. This will reduce the damage and service disruptions that now occur because the line is above ground.

NATIONAL RAILROAD PASSENGER CORPORATION
FISCAL YEAR 1991 CAPITAL BUDGET JUSTIFICATION

($ MILLIONS)

IV. Information and Communication Systems - $13 Million

A. Funding of $9.5 million in FY91 will continue the Arrow Terminal Replacement Program begun in FY90 and will ensure that Amtrak's reservation system will function well into the future. The existing terminals are at the end of their useful lives and are experiencing frequent failures. They are located in virtually all staffed stations nationwide as well as in our reservations centers.

B. In FY91, we plan to provide $3.5 million to upgrade existing IBM equipment with advanced equipment which will achieve economies of scale through improved computing technology. In addition this upgrade will provide adequate computer capacity for the Corporation's requirements both now and in the future to support business growth.

V. Station Improvements - $13 Million

Capital funds will also be required to improve service quality, safety and handicapped accessibility at Amtrak's stations and commissaries. The specific locations to be selected hinge on the condition of the present facilities as well as the willingness of states and localities to share the cost of station improvements. Amtrak's more pressing station needs are in such locations as Ohio, California, New York, Pennsylvania, and the District of Columbia. The commissary in the District of Columbia is also a high priority project.

Additionally, we plan to provide $3 million in FY91 for the New York Penn Station to accommodate the station improvements required due to the completion of the Westside Connection.

VI. Other - $26 Million

We will use $8 million of capital as Amtrak's share of a joint project with MTA to construct a new Control Center office in New York. The plan requires $6 million to relocate the Los Angeles Reservation Sales Office and $4 million to improve the reservations communication network necessary to ensure the ongoing reliability of reservations system.

NATIONAL RAILROAD PASSENGER CORPORATION
NORTHEAST CORRIDOR IMPROVEMENT PROJECT (NECIP)
FISCAL YEAR 1991 BUDGET JUSTIFICATION

($ MILLIONS)

The Projects selected for funding in the proposed FY91 NECIP program represent the highest priority requirements to improve the safe operation of the Northeast Corridor.

1. Installation of CETC and related signal upgrades are proposed between Wilmington, Delaware and Newark, New Jersey. Pursuant to the cost allocation recommendations of the Department of Transportation and Related Agencies Appropriation Conference Report for FY89, Amtrak's share of the FY91 funding requirement of $15.0 million is $5.0 million, with the remaining $10.0 million to be funded by NJT and SEPTA partially through UMTA grants.	$	5.1
2. Electric Traction System Upgrades	$	15.9

These projects will begin to upgrade various electric traction system items that have not yet been addressed in the NECIP program.

- o Begin Frequency Converter Station replacement, as ConEdison has abandoned its waterside power source, and design and install two new 10MW frequency converters at Sunnyside Yard, New York.
- o Replace 138KV air-break disconnect switches in electric traction substations at Hackensack, NJ; Philadelphia, PA, and Perryville, MD.
- o Replace ground grids for lighting and power outage protection at Landover, MD; Newark, DE; Chase, MD; New York, NY, and Baltimore, MD.
- o Replace control cables at Chester, PA; Philadelphia, PA; Monmouth Jct. NJ; Hackensack, NJ, and Kearney, NJ.
- o Replace 12 KV trolley breaker equipment and associated relaying equipment.

NATIONAL RAILROAD PASSENGER CORPORATION
NORTHEAST CORRIDOR IMPROVEMENT PROJECT (NECIP)
FISCAL YEAR 1991 BUDGET JUSTIFICATION

($ MILLIONS)

- o Replace 4500 KVA transformers at Landover, MD and Kearney, NJ.
- o Install supervisory control systems to remotely monitor and control substation equipment between Trenton, NJ and New York, NY.

3. Bridge Replacement and Upgrades $ 9.0

- o Deck repairs to the Bush River and Gunpow River bridges, which will result in reduced maintenance costs and more reliable services.
- o Begin to repair the Hellgate Bridge to secure ballast deck, eliminating the possibility of the dislodgement of ballast onto the streets below.
- o Convert Patapsco River Bridge in Maryland, and Magee Street and Princeton Avenue bridges in Pennsylvania from open deck rigid construction to ballasted deck construction to improve ride quality and reduce operating costs.
- o Convert twenty-one other open deck bridges to ballasted deck bridges, thereby allowing speed to be increased as well as providing improved ride quality and reduced maintenance within Connecticut, Rhode Island, and Massachusetts.

4. Communication and Signal System Upgrades $ 2.3

This project will replace obsolete communication and signal system equipment, which will reduce train delays and provide for safer and more reliable operation.

- o Replace track circuit equipment from New Haven, CT to Boston, MA.
- o Replace old PL-1 signal units with new brighter signal lamps from Philadelphia, PA to New York, NY.
- o Replace deteriorated signal cables from Metuchen, NJ to Rahway, NJ.
- o Begin expansion of CETC on the Boston Division.

NATIONAL RAILROAD PASSENGER CORPORATION
NORTHEAST CORRIDOR IMPROVEMENT PROJECT (NECIP)
FISCAL YEAR 1991 BUDGET JUSTIFICATION

($ MILLIONS)

5. Rehabilitation of platform tracks in New York Penn Station. $ 4.6

   This project will convert five jointed rail tracks within Penn Station New York to CWR with direct fixation to improve ride quality and reduce maintenance costs.

6. Track Improvements — Roadbed $ 13.3

   o Installation of concrete ties, CWR and undercutting.

   o This funding will continue the conversion of two high speed tracks between New York and Washington to concrete tie construction and CWR.

   o The areas covered by this proposal include: Baltimore, MD; Wilmington, DE; Chester, PA; Philadelphia, PA, and Newark, NJ.

7. Track Improvements - High Speed Interlocking $ 6.0

   o Install two high speed interlockings between New Haven, CT and Boston, MA so as to provide high speed train operation.

8. High Level Platform $ 1.3

   o Construct two high level platforms at Route 128 Station, MA with cost to be jointly shared by MTA and Amtrak on an equal basis at a total cost of $2.6 million.

9. Track Configuration $ 1.3

   o Begin the rationalization and reconfiguration of interlockings from Penn to North Philadelphia which will result in increased speed and reduction in trip time and an improvement in ride quality.
   improvement in ride quality.

TOTAL $ 58.8

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U.S. Department of
Transportation

BUDGET ESTIMATES

FISCAL YEAR 1991

OFFICE OF THE SECRETARY OF TRANSPORTATION

SUBMITTED FOR USE OF
THE COMMITTEES ON APPROPRIATIONS

NEW ODD PAGE

NEW ODD PAGE

FY 1991 BUDGET ESTIMATES
DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

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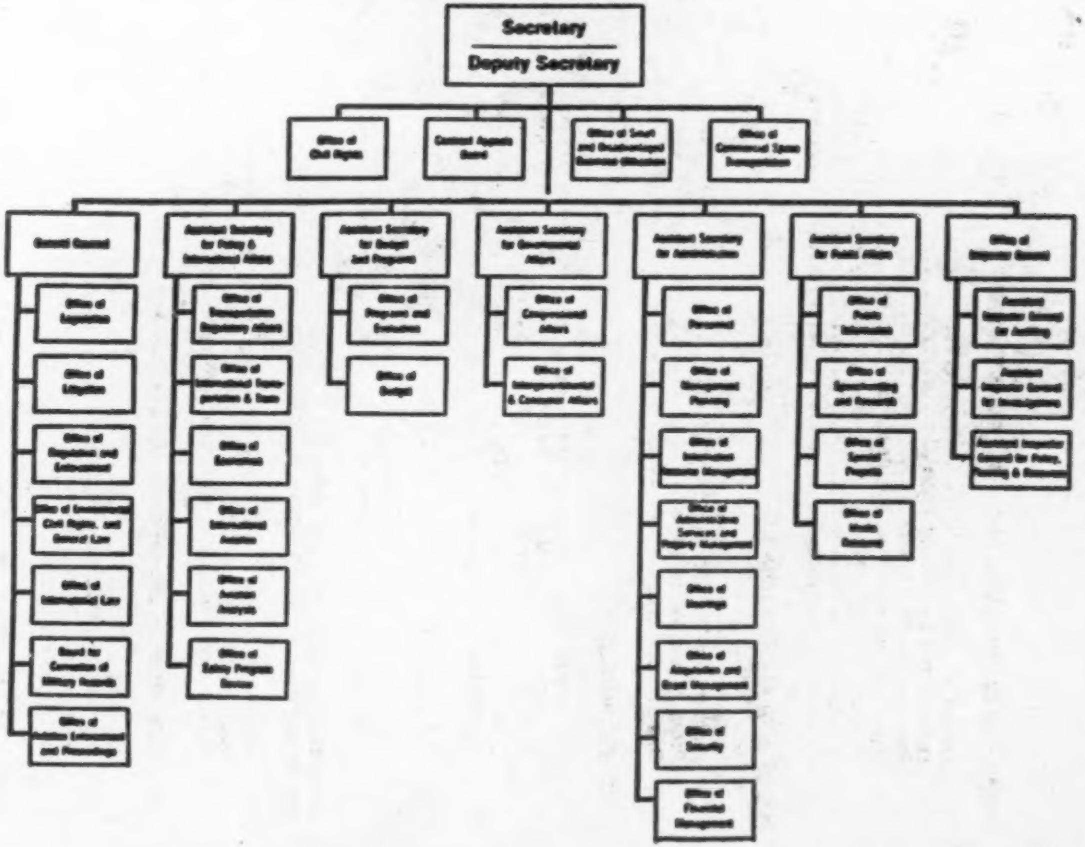
U.S. Department of Transportation

OFFICE OF THE SECRETARY


Secretary
Deputy Secretary
Office of Civil Rights
Contract Appeals Board
Office of Small and Disadvantaged Business Utilization
Office of Commercial Space Transportation
General Counsel
Office of Legislation
Office of Litigation
Office of Regulation and Enforcement
Office of Environmental, Civil Rights, and General Law
Office of International Law
Board for Correction of Military Records
Office of Aviation Enforcement and Proceedings
Assistant Secretary for Policy & International Affairs
Office of Transportation Regulatory Affairs
Office of International Transportation & Trade
Office of Economics
Office of International Aviation
Office of Aviation Analysis
Office of Safety Program Review
Assistant Secretary for Budget and Programs
Office of Programs and Evaluation
Office of Budget
Assistant Secretary for Governmental Affairs
Office of Congressional Affairs
Office of Intergovernmental & Consumer Affairs
Assistant Secretary for Administration
Office of Personnel
Office of Management Planning
Office of Information Resource Management
Office of Administrative Services and Property Management
Office of Hearings
Office of Acquisition and Grant Management
Office of Security
Office of Financial Management
Assistant Secretary for Public Affairs
Office of Public Information
Office of Speechwriting and Research
Office of Special Projects
Office of Media Relations
Office of Inspector General
Assistant Inspector General for Auditing
Assistant Inspector General for Investigations
Assistant Inspector General for Policy, Planning & Resources

OFFICE OF THE SECRETARY

SUMMARY STATEMENT

In FY 1991, budget authority requested for the Office of the Secretary is $102,745,000, excluding a proposed later transmittal to fund activities expected to be transferred following enactment of legislation to sunset the ICC.

The FY 1991 request includes:

— $60,135,000 for Salaries and Expenses, including $57,535,000 to fund the general management and administration of the Department. This request includes annualization of the January 1990 pay raise and funding for a 3.5 percent pay raise effective January 1, 1991 and the Executive Pay Raise. Also included in the OST request is $2,600,000 of new appropriations for support to the Minority Business Resource Center, assisting minority-owned firms in obtaining transportation contracts.

— $4,517,000 for Operations and Research-OCST, of which $3,103,000 is to support studies to promote and regulate commercial space transportation. (This Office was funded under Salaries and Expenses and TPR&D in FY 1990 and prior years.)

— $4,047,000 for Transportation, Planning, Research, and Development, of which $2,341,000 is to continue research and studies in support of national transportation policy.

— $23,600,000 for Payments to Air Carriers in support of the Essential Air Service program.

— $10,446,000 for the Working Capital Fund and Obligation Limitation of $146,809,000 to finance centralized Departmental services, to accommodate obligations for GSA headquarters rent and related services controlled through this account, and to fund continued development of the Department's Accounting and Financial Information System (DAFIS) and other automation activities.

Included under "Other Programs" are schedules for activities to be transferred from the Interstate Commerce Commission. Legislation has been proposed to sunset the ICC at the end of 1990 and transfer certain residual rail functions to the Department of Transportation.

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

SUMMARY OF FUNDING
(Dollars in Thousands)

Appropriation	FY 1990 Enacted Appropri-ation	FY 1991 Estimate	Difference
Salaries and Expenses	$55,195 1/	$60,135	+$4,940
Operations & Research-OCST	—	4,517 4/	+4,517
Transportation Planning, Research, and Development	6,748 2/	4,047	-2,701
Payments to Air Carriers	30,643 3/	23,600	-7,043
Working Capital Fund (Ob. Lim.)	4,441 (137,287)	10,446 (146,809)	+6,005 (+9,522)
Aviation Security Commission	1,000	—	-1,000
TOTAL	$98,027	$102,745	+$4,718

1/ Excludes $1.317 million FY 1989 MBRC unobligated carryover.

2/ Excludes $322,000 FY 1989 unobligated carryover.

3/ Excludes $6.266 million FY 1989 unobligated carryover.

4/ Funding for this account included in Salaries and Expenses and TPR&D in FY 1990 and prior years.

CONSULTING SERVICES

The Office of the Secretary's FY 1991 request contains $849,000 for advisory and assistance services, as defined in Office of Management and Budget (OMB) Circular A-120. The Salaries and Expenses appropriation request includes $73,000 in consulting services for the Office of Policy and International Affairs to provide advice, guidance and assistance in preparing studies and filings for regulatory proceedings, surface transportation, and highly controversial or costly public issues. The Operations and Research-OCST appropriation request includes $776,000 in consulting services for safety research, licensing monitoring and enforcement operations, and industry policy and planning.

STATEMENT OF PAYMENTS TO THE WORKING CAPITAL FUND IN FY 1991

In FY 1991, an amount of $15,297,000 from all appropriations in the Office of the Secretary will finance services provided through the Department's Working Capital Fund.

DOT is developing a DOT Order containing instructions for transition to the metric system, including establishment of a DOT-wide Metric Coordinating Committee.

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

STAFFING SUMMARY
AUTHORIZED POSITIONS AND FTE EMPLOYMENT

	Positions Full-time Permanent		Total Full-time Equivalent Employment 1/	
	FY 1990 Enacted	FY 1991 Estimate	FY 1990 Enacted	FY 1991 Estimate
Salaries and Expenses	682	653	643 2/	621
Salaries and Expenses, Reimbursable 3/	21	22	29	30
Operations & Research-OCST 4/	—	26	—	24
Transportation Planning, Research, and Development	33	23	32	22
Working Capital Fund	311	319	317	325
TOTAL	1,047	1,043	1,021	1,022

NOTE: 1/ Includes part-time and temporary employees, as well as those in permanent positions, subject to employment ceiling.

2/ Figure is total included in FY 1990 Conference Report language, including 13 for OCST which is proposed to be funded in separate account in FY 1991.

3/ Reimbursable positions/FTE adjusted to include Policy's Intermodal Planning Office.

4/ Office of Commercial Space Transportation included in Salaries and Expenses and TPR&D in FY 1990 and prior years.

DISTRIBUTION OF FY 1990 AND FY 1991 OST BUDGET AUTHORITY

(Dollars in Thousands)

S&E DIRECT	FY1990 ENACTED (SEQ.) PCAB$	TVL$	OTHER$	TOTAL$	POS	FTE	FY1991 BUDGET REQUEST PCAB$	TVL$	OTHER$	TOTAL$	POS	FTE
GEN COUNSEL	6,035	66	19	6,120	105	100	6,415	66	19	6,500	106	101
POLICY-EAS	1,687	25	15	1,727	30	29	[1,210]	[26]	[15]	[1,251]	[19]	[18]
POLICY-OTHER	8,109	124	17	8,250	157	139	9,693	128	40	10,061	175	159
BUDGET & PROG	2,277	8	40	2,325	38	36	2,342	8	50	2,400	38	36
GOVT AFFAIRS	2,270	18	12	2,300	46	44	2,225	18	12	2,255	44	42
ADMINISTRATION	9,910	55	14,735	24,700	172	168	10,578	60	18,850	29,488	174	172
PUBLIC AFFAIRS	1,302	13	35	1,350	26	25	1,341	13	35	1,389	26	25
SECR OFFICES	5,582	183	2,658	8,423	108	102	5,135	240	2,667	8,042	90	88
S-1 (SECR)	1,025	54	11	1,090	14	14	1,150	150	11	1,311	14	14
S-2 (DEP SEC)	437	22	11	470	10	9	453	23	11	487	10	10
S-10 (EX SEC)	829	1	5	835	21	20	912	1	5	918	21	20
S-20 (APP BD)	465	7	16	488	8	7	481	7	20	508	6	6
S-30 (CIV RTS)	1,279	21	15	1,315	24	23	1,312	21	20	1,353	23	21
S-40 (OSDBU)	862	0	38	900	18	16	827	0	38	865	16	15
S-40 (MBRC-$)	0	38	2,562	2,600	0	0	0	38	2,562	2,600	0	0
S-50 (OCST)	685	40	0	725	17	13	0	0	0	0	0	0
SUBTOT S&E	37,172	492	17,531	55,195	682	643	37,929	533	21,673	60,135	653	621
REIMBURSABLE	0	0	0	0	21	29	0	0	0	0	22	30
OPS & RES.(OCST)	[1,280]	[60]	[2,857]	[4,197]	[27]	[23]	1,339	75	3,103	4,517	26	24
T P R&D (P)	1,681	24	1,571	3,276	23	22	1,682	24	2,341	4,047	23	22
T P R&D (S-50)	595	20	2,857	3,472	10	10	0	0	0	0	0	0
WRKNG CAP FUND	N.A.	N.A.	N.A.	[137,287]	311	317	N.A.	N.A.	N.A.	[148,809]	319	325
W.C.F. APPROP.	0	0	4,441	4,441	0	0	0	0	10,446	10,446	0	0
PMTS-AIR CARR.	0	0	30,643	30,643	0	0	0	0	23,600	23,600	0	0
SECURITY COMM	0	0	1,000	1,000	0	0	0	0	0	0	0	0
TOTAL OST	39,448	536	58,043	98,027	1,047	1,021	40,950	632	61,163	102,745	1,043	1,022

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

SALARIES AND EXPENSES

[IMMEDIATE OFFICE OF THE SECRETARY]

[For necessary expenses of the Immediate Office of the Secretary, $1,090,000.]

[IMMEDIATE OFFICE OF THE DEPUTY SECRETARY]

[For necessary expenses of the Immediate Office of the Deputy Secretary, $470,000.]

[OFFICE OF THE GENERAL COUNSEL]

[For necessary expenses of the Office of the General Counsel, $6,120,000.]

[OFFICE OF THE ASSISTANT SECRETARY FOR POLICY AND INTERNATIONAL AFFAIRS]

[For necessary expenses of the Office of the Assistant Secretary for Policy and International Affairs, $8,250,000.]

[OFFICE OF THE ASSISTANT SECRETARY FOR BUDGET AND PROGRAMS]

[For necessary expenses of the Office of the Assistant Secretary for Budget and Programs, $2,325,000, including not to exceed $40,000 for allocation within the Department of official reception and representation expenses as the Secretary may determine.]

[OFFICE OF THE ASSISTANT SECRETARY FOR GOVERNMENTAL AFFAIRS]

[For necessary expenses of the Office of the Assistant Secretary for Governmental Affairs, $2,300,000.]

[OFFICE OF THE ASSISTANT SECRETARY FOR ADMINISTRATION]

[For necessary expenses of the Office of the Assistant Secretary for Administration, $24,700,000.]

[OFFICE OF THE ASSISTANT SECRETARY FOR PUBLIC AFFAIRS]

[For necessary expenses of the Office of the Assistant Secretary for Public Affairs, $1,350,000.]

[EXECUTIVE SECRETARIAT]

[For necessary expenses of the Executive Secretariat, $835,000.]

[CONTRACT APPEALS BOARD]

[For necessary expenses of the Contract Appeals Board, $488,000.]

[OFFICE OF CIVIL RIGHTS]

[For necessary expenses of the Office of Civil Rights, $1,315,000.]

[OFFICE OF COMMERCIAL SPACE TRANSPORTATION]

[For necessary expenses of the Office of Commercial Space Transportation, $725,000.]

[OFFICE OF ESSENTIAL AIR SERVICE]

[For necessary expenses of the Office of Essential Air Service, $1,727,000.]

[OFFICE OF SMALL AND DISADVANTAGED BUSINESS UTILIZATION]

For necessary expenses of the [Office of Small and Disadvantaged Business Utilization, $3,500,000] Office of the Secretary, $60,135,000 of which $2,600,000 shall remain available until expended and shall be available for the purposes of the Minority Business Resource Center as authorized by 49 U.S.C. 332; and of which not to exceed $50,000 shall be available, as the Secretary may determine, for allocation within the Department for official reception and representation expenses: *Provided*, That, notwithstanding any other provision of law, funds available for the purposes of the Minority Business Resource Center in this or any other Act may be used for business opportunities related to any mode of transportation. (Department of Transportation and Related Agencies Appropriations Act, 1990.)

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

SALARIES AND EXPENSES

PROGRAM AND FINANCING (in thousands of dollars)

	Identification Code 69-0102-0-1-407	1989 Actual	1990 Estimate	1991 Estimate
	Program by activities			
	Direct program:			
00.01	General administration..............	51,285	52,595	57,535
00.02	Minority Business Resource Center............................	1,441	3,917	2,600
00.91	Total direct program..............	52,726	56,512	60,135
01.01	Reimbursable program...............	5,286	10,200	10,900
10.00	Total obligations.................	58,012	66,712	71,035
	Financing:			
11.00	Offsetting collections from: Federal funds.....................	-5,286	-10,200	-10,900
17.00	Recovery of prior year obligations..	-239	—	—
21.40	Unobligated balance available, start of year.....................	-636	-2,242	-925
24.40	Unobligated balance available, end of year.......................	2,242	925	925
25.00	Unobligated balance lapsing.........	449	—	—
40.00	Budget authority (appropriation)	54,542	55,195	60,135
	Relation of obligations to outlays:			
71.00	Obligations incurred, net...........	52,726	56,512	60,135
72.40	Obligated balance, start of year....	8,035	10,332	10,569
74.40	Obligated balance, end of year......	-10,332	-10,569	-11,042
77.00	Adjustments in expired accounts.....	-979	—	—
78.00	Adjustments in unexpired accounts...	-239	—	—
90.00	Outlays.............................	49,211	56,275	59,662

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

SALARIES AND EXPENSES
(MINORITY BUSINESS RESOURCE CENTER)
STATUS OF DIRECT LOANS (in thousands of dollars)

Identification code 69-0102-0-1-407	1988 Actual	1989 Estimate	1990 Estimate
Cumulative balance of direct loans outstanding:			
1210 Outstanding, start of year. . .	15,342	15,342	15,342
1290 Outstanding, end of year . . .	15,342	15,342	15,342

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

SALARIES AND EXPENSES

PROGRAM AND PERFORMANCE

General administration. - This appropriation finances the costs of policy development and central supervisory and coordinating functions necessary for the overall planning and direction of the Department. It covers the immediate secretarial offices as well as those of the assistant secretaries and the general counsel. The budget reflects staff reductions associated with the proposed reduction in the Essential Air Service program and funding of commercial space transportation functions under a separate account.

The Minority Business Resource Center. - This activity provides contractual support for the Center to assist minority business firms, entrepreneurs, and venture groups in securing contracts and subcontracts arising out of projects that involve Federal funding.

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

SALARIES AND EXPENSES

OBJECT CLASSIFICATION (in thousands of dollars)

Identification Code 69-0102-0-1-407		1989 Actual	1990 Estimate	1991 Estimate
	Direct obligations:			
	Personnel compensation:			
11.1	Full-time permanent	28,408	30,914	31,295
11.3	Other than full-time permanent	1,930	982	1,052
11.5	Other personnel compensation	763	651	661
11.8	Special personal services payments	118	138	138
11.9	Total personnel compensation	31,219	32,685	33,146
12.1	Personnel benefits: Civilian	4,284	4,628	4,706
13.0	Benefits for former personnel	42	77	77
21.0	Travel and transportation of persons	505	583	533
22.0	Transportation of things	23	50	77
23.1	Rental payments to GSA	5,172	6,065	6,352
23.3	Communications, utilities, and miscellaneous charges	1,395	1,678	1,712
24.0	Printing and reproduction	1,121	1,125	1,164
25.0	Other services	7,885	9,296	11,957
26.0	Supplies and materials	257	225	311
31.0	Equipment	284	100	100
41.0	Grants, subsidies, and contributions	539	—	—
99.0	Subtotal, direct obligations	52,726	56,512	60,135
99.0	Reimbursable obligations	5,286	10,200	10,900
99.9	Total obligations	58,012	66,712	71,035

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

SALARIES AND EXPENSES

PERSONNEL SUMMARY

Identification code 69-0102-0-1-407	1989 Actual	1990 Estimate	1991 Estimate
Direct:			
Total number of full-time permanent positions	663	682	653
Total compensable workyears:			
Full-time equivalent employment	648	657	635
Full-time equivalent of overtime and holiday hours	5	5	5
Reimbursable: 1/			
Total number of full-time permanent positions	19	21	22
Total compensable workyears:			
Full-time equivalent employment	34	54	55

1/ Adjusted in FY 1990 and FY 1991 to include Policy's Intermodal Planning Office.

SALARIES AND EXPENSES

SUMMARY STATEMENT

The Salaries and Expenses appropriation for the Office of the Secretary finances all activities associated with the central Departmental management role of the Office of the Secretary of Transportation. Included are the formulation and direction of national transportation policies and programs carried out within the Office of the Secretary. Also included in this appropriation is the Minority Business Resource Center which assists minority business groups in securing contracts arising out of transportation-related projects involving Federal funding. The budget request for the Office of Commercial Space Transportation, previously included under the SALARIES AND EXPENSES and TRANSPORTATION PLANNING, RESEARCH, AND DEVELOPMENT appropriations in FY 1990 and in prior years, is submitted herein under a separate heading entitled OPERATIONS AND RESEARCH-OCST for FY 1991.

In FY 1991, emphasis will be placed on reducing unnecessary size. Management direction will be placed on issues dealing with maintaining, upgrading, and improving the infrastructure and safety of the Nation's transportation system. Attention will also focus on achieving greater efficiency in providing transportation services and facilities, placing a more equitable share of the costs on transportation users, easing Government regulations where appropriate, and research to address current and future requirements.

The appropriations act language requested for FY 1991 consolidates the office by office funding for the general administration portion of the Salaries and Expenses appropriation into a single account. The restrictions imposed by the FY 1990 appropriations act language leave very little flexibility within OST and severely limit the Secretary's ability to shift resources to meet workload requirements and priorities. The individual office allocations in the FY 1990 language also increase the workload on the accounting and budget staffs. Micro-management and detailed accounting and budgetary controls and procedures have to be implemented in order to prevent problems from occurring due to this restrictive language. Of all government agencies, Agriculture is the only other agency subject to this treatment.

An appropriation of $60,135,000 is requested for Fiscal Year 1991, including $2,600,000 for the Minority Business Resource Center. This represents a net increase of $3,623,000 compared with the Fiscal Year 1990 program level. The principal elements of this increase are: $2,349,000 for funding of personnel costs at the current authorized staff levels, normal within-grade and merit pay increases, annualization of the FY 1990 pay raise, and funding of 50 percent (the remainder is absorbed) of a 3.5 percent pay raise effective January 1, 1991, and the Executive Pay Raise; $933,000 net increase for non-discretionary administrative support costs including GSA space rental rates; and $3,250,000 for program increases, including $2,540,000 for the OST portion of the OST Office Automation Project. These increases are partially offset by reductions

(-$1,592,000) in personnel and administrative support costs resulting from the proposed reductions in the Essential Air Service program and associated staffing, reduced staffing in several other offices, and the proposed move of the Commercial Space program to a separate appropriation, along with use of $1,317,000 carryover in MBRC from FY 1989.

The full-time permanent position level requested in FY 1991 is 653, a net decrease of 29 from the FY 1990 enacted level. This reflects a reduction of: 12 in the Policy Office, including 11 in the Office of Essential Air Service; two in Governmental Affairs; one in the Office of Civil Rights; and 17 associated with the shift of the Office of Commercial Space Transportation to a separate appropriation. Additional positions requested are: one in the Office of General Counsel and two in the Office of Administration.

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

SALARIES AND EXPENSES

SUMMARY OF FUNDING
(in thousands of dollars)

	FY 1990 Estimate	FY 1991 Estimate
GENERAL ADMINISTRATION:		
Immediate Office of the Secretary	$1,090	$1,311
Immediate Office of the Deputy Secretary	470	487
General Counsel	6,120	6,500
Policy and International Affairs	8,250	10,061
Office of Essential Air Service	1,727	(1,251) 2/
Budget and Programs	2,285	2,350
Reception and Representation Allowance	40	50
Governmental Affairs	2,300	2,255
Administration	24,700	29,488
Public Affairs	1,350	1,389
Executive Secretariat	835	918
Contract Appeals Board	488	508
Office of Civil Rights	1,315	1,353
Office of Commercial Space Transportation	725	— 3/
Office of Small and Disadvantaged Business Utilization	900	865
Subtotal, General Administration	52,595	57,535
MINORITY BUSINESS RESOURCE CENTER	3,917 1/	2,600
Total Salaries and Expenses	$56,512	$60,135

1/ Includes $1.317 million MBRC unobligated carryover.

2/ Essential Air Service program to be phased-out over five-year period. In FY 1991, funding for this program is shown under the Policy and International Affairs Office. The $1,251,000 reflects a staffing level of 18 FTE.

3/ The Office of Commercial Space Transportation is included under a separate account in FY 1991 (OPS & RESEARCH - OCST).

SALARIES AND EXPENSES

GENERAL COUNSEL (C)

	FY 1990 Estimate 1/	FY 1991 Estimate	Difference
Permanent Positions	105	106	+1
Full-time Equivalents ..	100	101	+1
Personnel Compensation and Benefits	$6,035,000	$6,415,000	+$380,000
Other Costs	85,000	85,000	----
Total	$6,120,000	$6,500,000	+$380,000

1/ Includes 3 positions/FTE transferred from Public Affairs as part of FOIA function in February 1989; however, sufficient funding for the transfer was not provided in the enacted level.

The General Counsel is the chief legal officer of the Department of Transportation and the final authority within the Department on all legal questions. The General Counsel's office provides legal services to the Office of the Secretary (including the conduct of aviation regulatory proceedings), coordinates and reviews the legal work of the Chief Counsels' offices of the operating administrations, and generally performs the full range of legal services involved in administering an executive department with national and international responsibilities.

Changes in Resources

The requested increase of one position/FTE reflects the proposed transfer of one position from the Office of Commercial Space Transportation.

The requested increase of $380,000 in personnel compensation and benefits represents the cost of funding one additional FTE and the costs associated with transferring of the FOIA function, as well as the increased cost of continuing current operations to annualize the FY 1990 pay raise, to fund 50 percent (the remainder is absorbed) of a 3.5 percent pay raise effective January 1, 1991 and the executive pay raise, and to fund normal within-grade and merit pay increases.

Justification of Program

The above requirements are necessary to carry out the mission of the Office of the General Counsel. Emphasis continues to be placed on implementing various transportation initiatives by providing the highest quality legal work to the Secretary and the Department.

SALARIES AND EXPENSES

GENERAL COUNSEL (C)

	PERMANENT POSITIONS		
	FY 1990	FY 1991	Difference
Immediate Office of the General Counsel			
Professional	5	5	---
Non-Professional	4	4	---
Total	9	9	---
Office of Environmental, Civil Rights and General Law			
Professional	17	17	---
Non-Professional	5	5	---
Total	22	22	---
Office of International Law			
Professional	12	12	---
Non-Professional	3	3	---
Total	15	15	---
Office of Litigation			
Professional	10	10	---
Non-Professional	3	3	---
Total	13	13	---
Office of Legislation			
Professional	7	7	---
Non-Professional	2	2	---
Total	9	9	---
Office of Regulation and Enforcement			
Professional	9	10	+1
Non-Professional	4	4	---
Total	13	14	+1
Documentary Services			
Professional	5	5	---
Non-Professional	6	6	---
Total	11	11	---

	PERMANENT POSITIONS		
	FY 1990	FY 1991	Difference
Board for Correction of Military Records			
Professional	2	2	---
Non-Professional	1	1	---
Total	3	3	---
Office of Aviation Enforcement and Proceedings			
Professional	8	8	---
Non-Professional	2	2	---
Total	10	10	---
Total - General Counsel			
Professional	75	76	---
Non-Professional	30	30	---
Total	105	106	+1

SALARIES AND EXPENSES

ASSISTANT SECRETARY FOR POLICY AND INTERNATIONAL AFFAIRS (P)

	FY 1990 Estimate	FY 1991 Estimate	Difference
Permanent Positions	187	175	-12
Full-time Equivalents	168	159	- 9
Personnel Compensation and Benefits ..	$9,796,000	$ 9,893,000	$ + 97,000
Other Costs	$ 181,000	$ 168,000	$ - 13,000
Total	$9,977,000	$10,061,000	$ + 84,000

The Assistant Secretary for Policy and International Affairs is the chief policy officer of the Department and is in charge of economic regulation of the airline industry. As chief policy officer, he is responsible to the Secretary for analysis, development, articulation, and review of policies and plans for domestic and international transportation. As overseer of airline economic regulations, he is responsible for international aviation programs, the essential air service program, airline licensing, airline consumer protection regulations, airline mergers and acquisitions, and route awards and special investigations such as airline delays and CRS. The office is also responsible for the conduct of independent safety reviews on the effectiveness of Departmental safety programs, and has the primary responsibility for determining and guaranteeing the required level of air service to communities eligible to receive essential air service and administering the essential air service subsidy program. The Assistant Secretary provides Departmental leadership and coordination on international transportation policy issues relating to maritime, surface transport, trade, technical assistance and cooperation programs.

Changes in Resources

An increase $719,000 is needed to annualize the FY 1990 pay raise, fund 50 percent (the remainder is absorbed) of a 3.5 percent pay raise effective January 1991 and the Executive pay raise, fund merit pay and normal within-grade increases, and two additional FTEs. This increase is offset by a decrease of eleven FTE in the Office of Essential Air Service ($622,000), with a net increase of $97,000 required in PC&B.

An increase of $8,000 requested for contracts is offset by a decrease of $21,000 in travel, for a net decrease of $13,000.

Justification

The FY 1991 request includes funding for two FTE in the Office of Aviation Analysis to provide support in the areas of domestic aviation and airline competition. The two FTE are offset by a decrease of eleven FTE in the Office of Essential Air Service, consistent with the proposed gradual phasing-out of the EAS program over a five-year period.

A funding increase is requested for contractual services due to increased contractual requirements and inflation. Funding at this level would permit contractual services for: translators and interpreters during bilateral and multilateral meetings; translation equipment; health insurance coverage for attendees from socialist countries; and membership in the American National Standards Institute's Accredited Standards Committee on Electronic Data Interchange.

SALARIES AND EXPENSES

ASSISTANT SECRETARY FOR POLICY AND INTERNATIONAL AFFAIRS (P)

STAFFING

	FY 1990	FY 1991	Difference
Office of the Assistant Secretary			
Professional	14	14	--
Non-Professional	5	5	--
Total	19	19	--
Office of Trans. Regulatory Affairs			
Professional	10	10	--
Non-Professional	5	5	--
Total	15	15	--
Office of Int'l Trans. & Trade			
Professional	18	18	--
Non-Professional	3	3	--
Total	21	21	--
Office of Economics			
Professional	10	10	--
Non-Professional	5	5	--
Total	15	15	--
Office of Int'l Aviation			
Professional	47	47	--
Non-Professional	8	8	--
Total	55	55	--
Office of Aviation Analysis			
Professional	18	18	--
Non-Professional	3	3	--
Total	21	21	--
Office of Essential Air Service 1/			
Professional	25	15	-10
Non-Professional	5	4	- 1
Total	30	19	-11
Office of Planning & Intermodal Policy			
Professional	9	8	- 1
Non-Professional	2	2	--
Total	11	10	- 1
Total Assistant Secretary for Policy & International Affairs			
Professional	151	140	-11
Non-Professional	36	35	- 1
Total	187	175	-12

1/ Funded separately in FY 1990

SALARIES AND EXPENSES

ASSISTANT SECRETARY FOR BUDGET AND PROGRAMS (B)

	FY 1990 Estimate	FY 1991 Estimate	Difference
Permanent Positions	38	38	—
Full-time Equivalents	36	36	—
Personnel Compensation and Benefits	$2,277,000	$2,342,000	+$65,000
Other Costs	48,000	58,000	+ 10,000
Total	$2,325,000	$2,400,000	+$75,000

The Assistant Secretary for Budget and Programs is the principal staff advisor to the Secretary on the development, review, and presentation of the Department's budget resource requirements, and on the evaluation and oversight of the Department's programs. The primary responsibilities of this office are to ensure the effective preparation and presentation of sound and adequate budget estimates for the Department, ensure the consistency of the Department's budget execution with the action and advice of the Congress and the Office of Management and Budget, evaluate the program proposals for consistency with the Secretary's stated objectives, and advise the Secretary of program and legislative changes necessary to improve program effectiveness.

Changes in Resources

No new programs or positions are requested for this office in Fiscal Year 1991. The increase in personnel costs is to annualize the FY 1990 pay raise, to fund 50 percent (the remainder is absorbed) of a 3.5 percent pay raise effective January 1, 1991 and the executive pay raise, and to fund the normal within-grade and merit pay increases. The increase in "Other Costs" is for the Secretary's official reception and representation expenses.

Within existing resources, this office coordinates the review and reporting of the progress toward achieving the management objectives the President has selected for the Department, as well as management objectives the Secretary has selected for the Administrations and the Secretarial offices.

SALARIES AND EXPENSES

ASSISTANT SECRETARY FOR BUDGET AND PROGRAMS (B)

	PERMANENT POSITIONS		
	FY 1990	FY 1991	Difference
Office of the Assistant Secretary			
Professional	3	3	—
Nonprofessional	2	2	—
Total	5	5	—
Office of Programs and Evaluation			
Professional	13	13	—
Nonprofessional	3	3	—
Total	16	16	—
Office of Budget			
Professional	14	14	—
Nonprofessional	3	3	—
Total	17	17	—
Total - Assistant Secretary for Budget and Programs			
Professional	30	30	—
Nonprofessional	8	8	—
Total	38	38	—

SALARIES AND EXPENSES

ASSISTANT SECRETARY FOR GOVERNMENTAL AFFAIRS (I)

	FY 1990 Estimate	FY 1991 Estimate	Difference
Permanent Positions...	46	44	-2
Full-Time Equivalent..	44	42	-2
Personnel Compensation and Benefits........	$2,270,000	$2,225,000	-$ 45,000
Other Costs...........	+ 30,000	+ 30,000	+ -----
Total	$2,300,000	$2,255,000	-$ 45,000

The Assistant Secretary for Governmental Affairs is the principal advisor to the Secretary on all Congressional and Intergovernmental activities and on all Department legislative initiatives and other relationships with Members of the Congress; promotes effective communication with other federal agencies and regional Department officials, and with State and local governments and national organizations for development of Departmental programs; and ensures that consumer preferences, awareness, and needs are brought into the decision-making process.

Changes in Resources

Increases in personnel compensation and benefits for normal within-grade and merit pay increases, to fund 50 percent (the remainder is absorbed) of a 3.5 percent pay raise effective January 1, 1991 and the executive pay raise, and to annualize the FY 1990 pay raise are offset by a reduction of two in staffing ($97,000), for a net decrease of $45,000.

SALARIES AND EXPENSES

ASSISTANT SECRETARY FOR GOVERNMENTAL AFFAIRS, (I)

	PERMANENT POSITIONS		
	FY 1990	FY 1991	Difference
Office of the Assistant Secretary			
Professional	7	7	---
Non-Professional	3	3	---
Total	10	10	---
Office of Congressional Affairs			
Professional	11	11	---
Non-Professional	3	3	---
Total	14	14	---
Office of Intergovernmental and Consumer Affairs			
Professional	19	18	-1
Non-Professional	3	2	-1
Total	22	20	-2
Total-Assistant Secretary for Governmental Affairs			
Professional	37	36	-1
Non-Professional	9	8	-1
Total	46	44	-2

SALARIES AND EXPENSES

ASSISTANT SECRETARY FOR ADMINISTRATION (M)

	FY 1990 Estimate	FY 1991 Estimate	Difference
Permanent Positions	172	174	+2
Full-time Equivalents ..	168	172	+4
Personnel Compensation and Benefits	$ 9,910,000	$10,578,000	$ +668,000
Other Costs	14,790,000	18,910,000	+4,120,000
TOTAL	$24,700,000	$29,488,000	$+4,788,000

The Assistant Secretary for Administration, the principal advisor to the Secretary on Departmental administrative management matters, is responsible for personnel and training, management policy, employment ceiling control system, automated systems policy, administrative operations, real and personal property management, acquisition management, grants management, internal Departmental financial systems, and ADP facilities and services. Major program activities include: developing administrative management policies and programs, monitoring and assessing Departmental organization and manpower distribution, evaluating the quality of administrative management programs in the various administrations, operating an executive personnel management program, providing staff advice to the Secretary on major systems acquisitions and planning, developing and administering the Department of Transportation (DOT) Headquarters ADP operations, including computer service operations. Major direct administrative services to the Office of the Secretary (OST) include such areas as accounting, procurement, personnel management, and ADP operations.

CHANGES IN RESOURCES

In addition to continuing on-going programs, the increased resources for FY 1991 (2 positions, 4 FTEs and $4,788,000) reflect the Department's renewed emphasis on ensuring program integrity through the program review process. Emphasis will be placed on the areas of procurement integrity and internal controls to ensure that Departmental policies and procedures are adequate and fully utilized; that management controls are in place and accountability clearly assigned; and that, when necessary, new policies and procedures are developed.

An accountant position and two FTEs are requested to carry out responsibilities in the Federal Managers' Financial Integrity Act. To date the Department has reported virtually no material internal control weaknesses other than those identified by the Inspector General in the audit process. With these positions the Office of the Secretary will be able to play an active role in assuring improved training and awareness of significant high risk internal control issues, to participate in the evaluation of internal control processes and to suggest improvements in identification of significant risks. The current commitment to this effort is one of meeting annual reporting requirements and providing policy guidance.

A procurement position and one FTE is required to cope with the increased workload associated with enactment of several statutes at the end of the 100th Congress. These statutes cover drug-free workplace requirements, small and disadvantaged business programs, including competitive 8(a) procurement and small business demonstrations, regulatory analyses of procurement-related rules, and procurement integrity provisions. Each of these statutes involves extensive new rulemaking efforts and new and increased areas of procurement oversight and instruction, plus day-to-day involvement with certain procurement activities. Further, because each statute created new requirements needing Secretarial monitoring, the scope and time required to complete acquisition management reviews will be increased.

One FTE for a telecommunication position is required for internal compliance monitoring and meeting external reporting requirements in the telecommunications area. In early FY 1990, the Federal Information Resource Management Regulations will be revised to reflect recent legislation, including PL 100-440 which mandates use of FTS 2000 and PL 99-500 which requires increased GSA oversight of telecommunications procurements. This position will be used to establish required internal controls and provide oversight of compliance with GSA regulations not previously required by GSA. DOT organizations have a significant number of procurements with FAA having an especially large number of complex telecommunications procurements now subject to GSA FIRMR oversight. More active participation is needed in internal control, triennial reviews, and the Productivity Program. Major program areas have been neglected, in particular local area network policies, oversight of DOT standards and data communications, and keeping DOT telecommunication practices abreast of technological changes in the fast changing telecommunications technology arena.

For Personnel Compensation and Benefits, the increase of $668,000 represents the cost of the four additional FTEs, annualization of the FY 1990 pay raise, funding for 50 percent (the remainder is absorbed) of a 3.5 percent pay raise effective January 1, 1991 and the executive pay raise, and funding of normal within-grade and merit pay increases.

For "Other Costs", an increase of $4,120,000 is requested. A net increase of $870,000 (6%) is requested due to inflation in on-going programs. The remaining $3,250,000 represents requests for increased funding in training and executive development, office automation, environmental auditing and telecommunications. The requested program increases are discussed further below:

Training and Executive Development ($155,000) - The Department needs to develop a more aggressive training program profile than has been demonstrated in the past. The constraint of training dollars, necessitated because of absorption of the pay raise and rent increases, has severely limited our ability to offer quality training programs by reducing the number of courses offered and limiting training opportunities. The additional training request for FY 1991 will provide for increased program costs resulting from inflation, cover increased course offerings in the areas of office automation/software and clerical/secretarial skills programs, and provide valuable support skills training.

OST Office Automation ($+2,540,000) - The goal of the Office Automation Project is to integrate office automation and data processing technology into the day-to-day activities of OST in order to improve the operating efficiency, performance, and productivity of the work force. In this context, office automation and data processing technology is defined as the tools, procedures, and processes that support the effective acquisition, storage manipulation, and communication of data and information needed by OST to manage and administer its affairs.

With Office Automation, OST will be able to realize the full benefits of timely and accurate data to respond to other agencies; reduce paperwork; simplify workflow; and improve productivity and efficiency. OST automation needs focus heavily on rapid and accurate processing of large volumes of information and it is a weak link in responding to OMB, Congress, central agencies and the public because we do not have proper automation tools. Additionally, automation will allow us to process procurements faster, shorten the cycles to dispense regulations, and better coordinate staff work. The automation program is in keeping with Government-wide initiatives of increasing productivity and providing better service to the public and industry.

Funding was requested in FY 1990 to initiate this effort; however, it was not implemented because of the need to absorb the pay increase, SLUC costs, and other reductions. This funding is requested to initiate the program which, by the end of 1991, will allow for automation of approximately 60 percent of the staff. Compatibility of equipment will not be achieved until the program is fully implemented in 1992. Funding provides for installation and implementation, acceptance testing, maintenance support, operational support, training, etc.

Library Modernization ($40,000) - The DOT library is undertaking a modernization program to implement improved library science applications, such as automated indexing and literature searches, that utilize advanced equipment and technology and reduce stock space. This represents OST's share of the cost of this effort which will, over the long term, reduce overall library costs.

Environmental Auditing ($+150,000) - This funding is requested to establish a program of environmental auditing. The environmental program involves a myriad of statutes. In order to achieve and maintain compliance with all of these regulations, the Department's facilities must be continually reviewed to identify potential and existing environmental problems. Environmental auditing activities have been limited in that there are no formal permanent programs. In addition, the existing activities usually focus on one or a few topical areas, rather than the full range of environmental regulations. The Department needs to make a significant commitment to this program to ensure compliance with the large number of Federal, state and local regulations. With this funding, an Environmental Auditing Program for the high-risk facilities of the Department could be undertaken. Audits are designed to verify compliance with environment regulatory requirements, evaluate the effectiveness of environmental management systems already in place, and to assess risks from regulated or unregulated materials and practices.

Real Property Surveys ($+15,000) - This is requested for contract support in conducting a selected annual real property survey program for the Department. This program will increase the probability of identifying excessing opportunities. Additionally, it is estimated that the value of excessed property will exceed annual cost by a 12 to 1 ratio.

Study/Evaluate Telecommunication Requirements of the Department ($+350,000) - There are several telecommunication initiatives underway in the Department. Some of these address immediate needs of specific organizational components; others offer the Department an opportunity to achieve a level of connectivity. However, there is a need to obtain a more long term view of telecommunication requirements and ensure that the Department pursues these needs in a cohesive and integrated manner, in accordance with a telecommunication plan.

Specifically, there is a need to assure cost-effective utilization of FTS 2000. A study similar to the one recently completed for USDA, that will identify cost-effective approaches for identifying existing and new services that can be transferred to FTS 2000, is needed for OST. The all-digital nature of FTS 2000, a capability not yet widely available to the private sector, will require new and innovative service rearrangement if the full cost savings are to be realized. DOT will be unable to fully utilize FTS 2000 cost-effectively and the cost projections for FY 1991 by GSA will be low if this study is not undertaken.

SALARIES AND EXPENSES

ASSISTANT SECRETARY FOR ADMINISTRATION (M)

	PERMANENT POSITIONS		
	FY 1990	FY 1991	Difference
Assistant Secretary			
Professional	5	5	---
Non-Professional	3	3	---
Total	8	8	---
Personnel			
Professional	38	38	---
Non-Professional	14	14	---
Total	52	52	---
Management Planning			
Professional	17	17	---
Non-Professional	3	3	---
Total	20	20	---
Information Resource Management			
Professional	15	15	---
Non-Professional	3	3	---
Total	18	18	---
Administrative Services and Property Management			
Professional	14	14	---
Non-Professional	4	4	---
Total	18	18	---
Hearings			
Professional	7	7	---
Non-Professional	3	3	---
Total	10	10	---
Acquisition and Grant Management			
Professional	23	24	+1
Non-Professional	5	5	---
Total	28	29	+1
Financial Management			
Professional	15	16	+1
Non-Professional	3	3	---
Total	18	19	+1
TOTAL ASSISTANT SECRETARY FOR ADMINISTRATION			
Professional	134	136	+2
Non-Professional	38	38	---
Total	172	174	+2

SALARIES AND EXPENSES

ASSISTANT SECRETARY FOR PUBLIC AFFAIRS (A)

	FY 1990 1/ Estimate	FY 1991 Estimate	Difference
Permanent Positions . .	26	26	-
Full-time Equivalents. .	25	25	-
Personnnel Compensation and Benefits	$1,302,000	$1,341,000	+$39,000
Other Costs	48,000	48,000	-
Total	$1,350,000	$1,389,000	+$39,000

1/ Reflects transfer of 3 positions/FTEs to Office of General Counsel as part of FOIA function in February 1989.

The Assistant Secretary for Public Affairs is the principal advisor to the Secretary and other senior Departmental officials and news media on public affairs questions. The office issues news releases, articles, fact sheets, briefing materials, publications and audio-visual materials. It also provides information to the Secretary on opinions and reactions of the public and news media on programs and on transportation issues. It arranges news conferences and provides speeches, talking points, and byline articles for the Secretary and other senior Department officials, and arranges the Secretary's media scheduling.

Changes in Resources

An increase of $39,000 in personnel costs is to fund normal within-grade and merit pay increases, to annualize the FY 1990 pay raise, and to fund 50 percent (the remainder is absorbed) of the executive pay raise and a 3.5 percent pay raise effective January 1, 1991.

SALARIES AND EXPENSES

ASSISTANT SECRETARY FOR PUBLIC AFFAIRS (A)

	PERMANENT POSITIONS		
	FY 1990	FY 1991	Difference
Assistant Secretary			
Professional	7	7	---
Non-Professional	1	1	---
Total	8	8	---
Office of Speechwriting & Research			
Professional	2	2	---
Non-Professional	1	1	---
Total	3	3	---
Office of Public Information			
Professional	7	7	---
Non-Professional	3	3	---
Total	10	10	---
Office of Media Relations and Special Projects			
Professional	4	4	---
Non-Professional	1	1	---
Total	5	5	---
Total - Assistant Secretary for Public Affairs			
Professional	20	20	---
Non-Professional	6	6	---
Total	26	26	---

SALARIES AND EXPENSES

THE SECRETARIAL OFFICES (S)

	FY 1990 1/ Estimate	FY 1991 Estimate	Difference
Permanent Positions	108	90	-18
Full-time Equivalents . . .	102	86	-16
Personnel Compensation and Benefits	$ 5,582,000	$ 5,135,000	-$ 447,000
Minority Business Resource Center.	2,600,000	2,600,000	0
Other Costs	241,000	307,000	+ 66,000
Total	$ 8,423,000	$ 8,042,000	-$ 381,000

Included under this heading is the Immediate Office of the Secretary which encompasses the staffs of the Secretary and the Deputy Secretary, the Executive Secretariat, and the Offices of Civil Rights, Contract Appeals Board, and Small & Disadvantaged Business Utilization. The primary responsibility of this organization is to provide overall planning, direction, and control of Department affairs. Also included is the exercise of executive direction over the Minority Business Resource Center and conducting programs directed at stimulating, promoting and assisting minority business enterprise participation in Department procurement and Federal financial assistance activities.

The budget request for the Office of Commercial Space Transportation, which was included under this heading in FY 1990 and prior years, is submitted under a separate appropriation request entitled "Operations and Research-OCST" for FY 1991.

Changes in Resources

An increase of $426,000, required to annualize the FY 1990 pay raise, to fund 50 percent (the remainder is absorbed) of a 3.5 percent pay raise effective January 1, 1991, and the executive pay raise, for normal within-grade and merit pay increases, and to fund one additional FTE, is offset by $873,000 due to a reduction of four FTE in various offices ($153,000) and the OCST funding ($720,000) for 13 FTE in FY 1991.

Additional and specific changes in resources are addressed in the offices' individual displays which follow.

1/ Includes Office of Commercial Space Transportation ($725,000).

SALARIES AND EXPENSES

THE SECRETARIAL OFFICES (S)

	PERMANENT POSITIONS		
	FY1990	FY1991	Difference
Office of the Secretary			
Professional	10	10	--
Non-Professional	4	4	--
Total	14	14	--
Office of the Deputy Secretary			
Professional	6	6	--
Non-Professional	4	4	--
Total	10	10	--
Executive Secretariat			
Professional	12	12	--
Non-Professional	9	9	--
Total	21	21	--
Contract Appeals Board			
Professional	4	4	--
Non-Professional	2	2	--
Total	6	6	--
Civil Rights			
Professional	15	15	--
Non-Professional	9	8	-1
Total	24	23	-1
Small and Disadvantaged Business Utilization			
Professional	12	12	--
Non-Professional	4	4	--
Total	16	16	--
Commercial Space Transportation[1]			
Professional	14	--	-14
Non-Professional	3	--	-3
Total	17	--	-17
Total, Secretarial Offices			
Professional	73	59	-14
Non-Professional	35	31	-4
Total	108	90	-18

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[1] Funded under a separate account (OPS & RESEARCH-OCST) in FY 1991.

SALARIES AND EXPENSES

IMMEDIATE OFFICE OF THE SECRETARY

	FY 1990 Estimate	FY 1991 Estimate	Difference
Permanent Positions	14	14	---
Full-time Equivalents	14	14	---
Personnel Compensation and Benefits	$1,025,000	$ 1,150,000	+ $125,000
Other Costs	65,000	161,000	96,000
Total	$1,090,000	$ 1,311,000	+ $221,000

The Immediate Office of the Secretary has the primary responsibility to provide overall planning, direction, and control of Departmental affairs.

Changes in Resources

An increase of $125,000 is required for annualization of the FY 1990 pay raise, to fund 50 percent (the remainder is absorbed) of a 3.5 percent pay raise effective January 1, 1991, and the executive pay raise, and for normal within-grade and merit pay increases. The $96,000 increase is requested for anticipated travel costs associated with the Secretary's commitment to aviation security and implementation of the National Transportation Policy.

OFFICE OF THE DEPUTY SECRETARY

	FY 1990 Estimate	FY 1991 Estimate	Difference
Permanent Positions	10	10	---
Full-time Equivalents	9	10	+1
Personnel Compensation and Benefits	$ 437,000	$ 453,000	+ $16,000
Other Costs	33,000	34,000	+ 1,000
Total	$ 470,000	$ 487,000	+ $17,000

The Office of the Deputy Secretary encompasses the immediate office staff of the Deputy Secretary whose primary responsibility is to assist in the overall planning, direction, and control of Departmental affairs.

Changes in Resources

An increase of $16,000 is required to fund one additional FTE, to annualize the FY 1990 pay raise, to fund 50 percent (remainder is absorbed) of a 3.5 percent pay raise effective January 1, 1991,and executive pay raise, and for normal within-grade and merit pay increases. The additional FTE is required for special assignments involving high priority transportation issues as they arise. The additional $1,000 in "Other Costs" is due to increased travel costs.

EXECUTIVE SECRETARIAT

	FY 1990 Estimate	FY 1991 Estimate	Difference
Permanent Positions	21	21	--
Full-time Equivalents	20	20	--
Personnel Compensation and Benefits	$ 829,000	$ 912,000	+ $ 83,000
Other Costs	6,000	6,000	---
Total	$ 835,000	$ 918,000	+ $ 83,000

The Executive Secretariat provides an organized staff service for the Secretary and Deputy Secretary to assist them in carrying out their management functions and facilitate their responsibilities for formulating, coordinating and communicating major policy decisions. It controls and coordinates internal and external material directed to the Secretary and Deputy Secretary and ensures that their decisions and instructions are implemented.

Changes in Resources

An increase of $83,000 is required to annualize the FY 1990 pay raise, to fund 50 percent (the remainder is absorbed) of a 3.5 percent pay raise effective January 1, 1991, and the executive pay raise, and for normal within-grade and merit pay increases.

SALARIES AND EXPENSES

BOARD OF CONTRACT APPEALS

	FY 1990 Estimate	FY 1991 Estimate	Difference
Permanent Positions	6	6	0
Full-time Equivalents	7	6	-1
Personnel Compensation and Benefits	$ 465,000	$ 481,000	+ $ 16,000
Other Costs	$ 23,000	$ 27,000	+ $ 4,000
Total	$ 488,000	$ 508,000	+ $ 20,000

The primary responsibility of the Board of Contract Appeals is to provide an independent forum for the trial and adjudication of all claims by or against a contractor relating to a contract of any element of the Department, as mandated by the Contract Disputes Act of 1978, 41 U.S.C. § 601 *et seq.*

Changes in Resources

An increase of $33,000 in "Personnel Compensation and Benefits" required for annualization of the 1990 pay raise, for 50 percent (the remainder is absorbed) of a 3.5 percent pay raise effective January 1, 1991, and the executive pay raise, and for normal within-grade and merit pay increases, is offset by a decrease of one FTE (-$17,000), for a net increase of $16,000. An increase of $4,000 in "Other Costs" is required to offset increased charges by court reporting companies. The "Other Costs" category is also affected by an increase in the number of cases filed.

SALARIES AND EXPENSES

OFFICE OF CIVIL RIGHTS

	FY 1990 ESTIMATE	FY 1991 ESTIMATE	DIFFERENCE
Permanent Positions	24	23	-1
Full-time Equivalent	23	21	-2
Personnel Compensation and Benefits	$1,279,000	$1,312,000	$+33,000
Other Costs	36,000	41,000	+ 5,000
TOTALS	$1,315,000	$1,353,000	$+38,000

Office of Civil Rights Responsibility:

The Office of Civil Rights has primary responsibility for assisting the Departmental Director of Civil Rights in advising and representing the Secretary on civil rights and equal opportunity matters and ensuring full implementation of civil rights and equal opportunity precepts in all of the Department's official actions.

Funding Changes:

An increase of $116,000 in personnel compensation and benefits required for annualization of the FY 1990 pay raise, for 50 percent (the remainder is absorbed) of a 3.5 percent pay raise effective January 1, 1991 and the executive pay raise, and for normal within-grade and merit pay increases, is offset by the reduction of two FTE (-$83,000), for a net increase of $33,000.

The increase of $5,000 requested for "Other Costs" is due to increased costs and activity in contractual services. Services included are: pre-conference seminars for DOT employees at national level women's and Hispanic conferences; conducting discrimination complaint investigations; and Departmental manual for operating administrations and Federal financial assistance recipients.

SALARIES AND EXPENSES

OFFICE OF SMALL AND DISADVANTAGED BUSINESS UTILIZATION

	FY 1990 Estimate	FY 1991 Estimate	Difference
Permanent Positions. . .	16	16	-----
Full-time Equivalents. .	16	15	-1
Personnel Compensation and Benefits	$ 862,000	$ 827,000	$-35,000
Other Costs.	38,000	38,000	-----
Minority Business Resource Center. . . .	2,600,000	2,600,000	-----
Total.	$3,500,000	$3,465,000	$-35,000

The Office of Small and Disadvantaged Business Utilization has primary responsibility for providing policy direction for small and disadvantaged business participation in the Department's procurement and grant programs, and effective execution of the functions and duties under sections 8 and 15 of the Small Business Act, as amended.

The Minority Business Resource Center (MBRC) designs and conducts a coordinated program of activities directed at stimulating, promoting and actively assisting minority business enterprise and small and disadvantaged business participation in Departmental procurement and Federal financial assistance activities.

Changes in Resources

An increase of $18,000 for annualization of the FY 1990 pay raise, for 50 percent (the remainder is absorbed) of a 3.5 percent pay raise effective January 1, 1991 and the executive pay raise, and for normal within-grade and merit pay increases is offset by a decrease of one FTE (-$53,000), for a net decrease of $35,000 in PC&B.

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

OPERATIONS AND RESEARCH-OCST

For necessary expenses for operations and research activities related to commercial space transportation, to remain available until expended, $4,517,000: Provided, That the unexpended balances of the appropriation "Transportation Planning, Research, and Development" associated with commercial space activities shall be transferred to and merged with this appropriation.

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

OPERATIONS AND RESEARCH-OCST

PROGRAM AND FINANCING (in thousands of dollars)

Identification Code 69-0108-0-1-407	1989 Actual	1990 Estimate	1991 Estimate
Program by activities:			
00.01 Operations............................	—	—	1,339
00.02 Research..............................	—	—	3,178
10.00 Total obligations.................	—	—	4,517
Financing:			
40.00 Budget authority (appropriation)...	—	—	4,517
Relation of obligations to outlays:			
71.00 Obligations incurred, net..............	—	—	4,517
74.40 Obligated balance, end of year.........	—	—	-2,050
90.00 Outlays...........................	—	—	2,467

NOTE: Includes $4,517 thousand in budget authority in 1991 from activities previously financed from:

(in thousands of dollars)

	1989	1990
Transportation Planning, Research, and Development	2,810	3,473
Salaries and Expenses	585	725

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

OPERATIONS AND RESEARCH-OCST

PROGRAM AND PERFORMANCE

This appropriation finances regulatory, research and development, and studies needed to carry out the Secretary's responsibilities as defined in Executive Order 12465 to encourage, facilitate, and promote commercial space launches by the United States private sector and to license and regulate commercial launches, launch site operations, and certain payloads under the Commercial Space Launch Act (Public Law 98-575). Prior to 1991, this activity was funded under the Transportation Planning, Research, and Development and Salaries and Expenses appropriations. Beginning in 1991, the Department will establish a user fee for the licensing program.

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

OPERATIONS AND RESEARCH-OCST

OBJECT CLASSIFICATION (in thousands of dollars)

Identification Code 69-0108-0-1-407	1989 Actual	1990 Estimate	1991 Estimate
Personnel compensation:			
11.1 Full-time permanent	—	—	1,101
11.3 Other than full-time permanent	—	—	29
11.5 Other personnel compensation	—	—	22
11.9 Total personnel compensation	—	—	1,152
12.1 Personnel benefits: Civilian	—	—	187
21.0 Travel and transportation of persons	—	—	75
25.0 Other services	—	—	3,103
99.9 Total obligations	—	—	4,517

PERSONNEL SUMMARY

	1989 Actual	1990 Estimate	1991 Estimate
Total number of full-time permanent positions	—	—	26
Total compensable workyears: Full-time equivalent employment	—	—	25

OPERATIONS AND RESEARCH

SUMMARY STATEMENT

This proposed appropriation, entitled Office of Commercial Space Transportation OPERATIONS AND RESEARCH, is a consolidation of the functions of the Office of Commercial Space Transportation previously funded under the SALARIES AND EXPENSES and TRANSPORTATION PLANNING, RESEARCH, AND DEVELOPMENT appropriations. This presentation reflects the accelerated pace of commercial launch activity and the increasingly operational nature of this Office. Also, a separate appropriation will permit the Department, the Office of Management and Budget, and the Congress to focus on the commercial space program as a distinct and increasingly important activity.

The FY 1991 consolidated request is $4,517,000, which is a net increase of $320,000 over the FY 1990 combined Salaries and Expenses and TPR&D enacted level. The main categories of this request are: $1,339,000 for funding of personnel costs, including annualization of the FY 1990 pay raise, a 3.5 percent pay raise effective January 1, 1991, and normal within-grade and merit pay increases; $75,000 for travel requirements; and $3,103,000 for research and safety contracts. The full-time permanent position level requested in FY 1991 is 26, a decrease of one from the combined FY 1990 enacted level.

OPERATIONS AND RESEARCH-OCST

FY 1991 Request by Budget Activity and Major Program

		FY 1990	FY 1991
		($000)	
I.	Operations	$1,280	$1,339
II.	Research	2,917	3,178
	A. Safety Research	1,397	1,515
	B. Space Safety Support and Management	435	100
	C. Licensing Monitoring and Enforcement Operations	575	725
	D. Industry Policy and Planning	400	713
	E. Program Support/Travel	110	125
	Total Appropriation	$4,197	$4,517

OPERATIONS AND RESEARCH-OCST

OFFICE OF COMMERCIAL SPACE TRANSPORTATION (OCST)

	FY 1990 Estimate 1/	FY 1991 Estimate	Difference
Permanent Positions	27	26	-1
Full-Time Equivalents	23	24	+1
Personnel Compensation and Benefits	$1,280,000	$1,339,000	$ + 59,000
Other Costs	60,000	75,000	+ 15,000
Research and Safety Contracts	2,857,000	3,103,000	+246,000
Total	$4,197,000	$4,517,000	$ +340,000

1/Combined total of resources in OST Salaries and Expenses and TPR&D

The primary duty of the Office of Commercial Space Transportation is to carry out the responsibilities defined in Executive Order 12465 to encourage, facilitate, and promote commercial space launches by the United States private sector and to license and regulate commercial launches, launch site operations and certain payloads under the Commercial Space Launch Act, as amended. The office also is an active participating member on the National Space Council.

Changes in Resources

A total of $1,339,000 is necessary in PC&B to fund 24 FTEs, to annualize the FY 1990 pay raise, to fund 50 percent (the remainder is absorbed) of a 3.5 percent pay raise effective January 1, 1991, and the executive pay raise, and for normal within-grade, FERS, and merit pay increases. This is an increase of one FTE and $59,000 over the combined S&E and TPR&D FY 1990 enacted level. The requested staff will support the commensurate increase in licensing, monitoring and enforcement activities. In FY 1991, as many as 40 U. S. commercial space launches are expected, up from 10 to 15 launches in FY 1990. At least 60 inspections are anticipated. In addition, three to six months are required to complete review of each launch license application depending on its complexity. The complexity of the issues that need to be considered in the licensing review will increase with the emergence of a dynamic industry as new companies enter the market, new vehicles and payloads, the development of commercial launch facilities and the performance of safety-related activities by commercial organizations instead of existing government organizations as is currently the practice for commercial launches at the national ranges, and growing concern about orbital operations.

An increase of $15,000 over the combined travel requirements in FY 1990, for a total of $75,000, is requested for travel. Increased inspections and other monitoring activities necessitate travel. The ability of OCST to assure the protection of public safety is dependent on an adequate travel budget to meet an expected two-fold increase in the number of inspection trips. In addition to inspections of operations at existing launch facilities, OCST travel will include trips to commercial spaceports under development in support of joint Federal State Environmental Impact Statements, guidance concerning the licensing requirements for the sites, and the development of necessary regulations to protect public safety. The geographic remoteness of these proposed commercial spaceports imposes additional travel burdens.

In the program justifications, costs after 1991 are shown for the purpose of indicating the extent of a program or its estimated costs if it should be continued. These estimates do not represent a request for future resources and do not necessarily constitute our entire outyear planning estimates.

A total of $3.103 million, an increase of $246,000 for Research and Safety Contracts is requested. The following is a breakdown of contract requirements by category:

A. SAFETY RESEARCH ($000) $1,515

Objectives: To establish the body of knowledge necessary to support the requirements of the Commercial Space Launch Act and amendments thereto; develop effective and efficient safety standards and regulations; and provide guidance to the commercial launch industry concerning regulatory aspects of new launch and payload concepts.

Accomplishments:

The U. S. commercial launch industry has exhibited dramatic growth under the Office of Commercial Space Transportation (OCST) oversight.

	Fiscal Year/Number			
	1988	1989	1990	1991
Commercial Launches	0	5	20-25	30-40
Commercial Spaceports	0	2	2	3

Using the results of the hazards and risk research initiated by the Office of Commercial Space Transportation several years earlier, OCST set insurance requirements in accordance with the Commercial Space Launch Act as amplified in the amendments of 1988. Insurance requirements now have been set for 12 to 15 companies operating at four or more different national launch ranges.

Commercial Launch Baseline Assessments documented existing range safety personnel qualifications, safety operations and launch safety equipment at the national ranges allowing OCST to license commercial launch activities from these sites.

In addition, OCST issued guidelines to industry to comply with the National Environmental Policy Act and completed Programmatic Environmental Assessments of Commercial Expendable Launch Vehicle Programs.

The Transportation Systems Center (TSC) has made a significant contribution to OCST's research and regulatory program. For example, TSC consolidated OCST's safety research findings into a major report, Hazards Analysis of Commercial Space Transportation. Since this widely acclaimed report, new research results have been obtained, prompting a major revision in FY 1990.

A large amount of data collected by OCST was used in the Interagency Group Report on Orbital Debris.

In support of its research, OCST systematically collected over 4,000 documents comprising about 200,000 pages of safety data which may now constitute the largest single Federal space safety data base.

During FY 1989, OCST completed the Congressionally mandated Evaluation of User Fees for Commercial Space Launch Licensing and A Study of the Scheduling of Commercial Launch Operations at National Ranges.

During FY 1990, based on its research, OCST issued standards and regulations for commercial launch ranges and on-orbit activities.

FY 1989 & 1990 Costs: $1,020 & $1,397

FY 1991	FY 1992	FY 1993	FY 1994	FY 1995
$1,515	$1,800	$2,000	$2,100	$2,200

1. Commercial Operations ($000) ($1,165)

The emergence of a dynamic commercial launch industry, the anticipated development of commercial launch facilities, mobile launch systems, and new payloads, including microgravity materials processing with reentry capability, present a challenge for an efficient regulatory program that ensures public safety while permitting innovation and international competitiveness of the American space industry. American Rocket Company has developed and is now testing a unique hybrid fueled vehicle. Major launch companies are redesigning their existing vehicles to increase their commercial effectiveness and will incorporate concepts derived from the Air Force/NASA Advanced Launch System program. The aircraft launched Pegasus creates a new concept of a launch range and its operations.

Launch capacity of national ranges is insufficient. Commercial launch sites will be under development in Hawaii and Florida, along with Australia, a site over which OCST will have some regulatory responsibility if United States launch companies are involved. Tens of millions of dollars in private investment will be dependent on OCST providing timely guidance and developing effective regulatory mechanisms.

OCST will develop a wide range of possible options for mitigating identified safety issues and evaluate selected options to ensure their technical and economic feasibility. Research undertaken in this area will consider the interaction of various safety components so that safety may be achieved in the most effective and efficient means possible. This approach recognizes the requirement of the Commercial Space Launch Act that private sector efforts should be encouraged and regulated only to the extent necessary to ensure compliance with international obligations of the United States and to protect the public health and safety, safety of property, and national security and foreign policy interests of the United States. OCST expects that this area will require concerted effort for an additional three years beyond FY 1991 as new launch systems, ranges, equipment, and payloads continue to be developed and integrated into the existing launch infrastructure.

a. Safety Personnel Qualifications & Certification [$300]

OCST research documented and evaluated range safety personnel requirements and training at the various national ranges. With commercial launch ranges operational by 1992 in several States, companies will no longer be dependent on government ranges. These new ranges will approach range safety somewhat differently than past practice at the national ranges. Computers will perform more tasks, making software logic critical to the provision of safety. In the context of other research concerning operations and equipment, range safety qualifications, standards, and certification procedures will be developed for commercial launches.

b. Safety Procedures [$300]

Commercialization and the introduction of different technology will shape the requirements for future launch and space operations. Commercial companies have control over factors affecting public safety that previously were exclusively under the control of the Government, and Government procedures and practice often are not appropriate models for these commercial operations. For the same reasons that safety procedures vary between existing ranges, the commercial ranges under development will employ their own procedures. New types of vehicles and payloads will result in the need to consider safety-related operations and procedures over the entire space flight. Research is not confined to launch operations but also involves documenting and assessing the adequacy of on-orbit operational procedures, vehicle navigation, tracking, advanced orbital predictions of possible collisions and collision avoidance systems.

c. Safety Equipment [$400]

The adequate design and reliability of safety related equipment is a fundamental element in protection of public health and property. Research will be directed at systems under development, including on-board computerized flight termination systems. The availability of highly accurate on-board navigational systems and changes in the existing tracking infrastructure, with satellites replacing ground tracking stations, will affect personnel qualifications and operational procedures. OCST will consider these impacts in developing certification procedures and requirements for safety equipment.

d. Payload Safety [$165]

Industrial space activities usher a new epoch for which there is little guidance concerning necessary safety regulation. Already companies are engaging in micro-gravity research and space manufacturing by developing reentry vehicles. The development of new kinds of payloads may increase the potential for on-orbit accidents with resulting debris.

Research in this area will determine and examine payload design factors related to safety and document and assess specific payload safety measures, both relative to orbital and reentry safety. It will assess the need for safety criteria for various kinds of payloads, and where necessary, develop safety criteria. The rapid development of new types of payloads will make this an area with a continued need for research.

2. Environmental Issues ($200)

Proposed new ranges will require the preparation of Environmental Impact Statements. OCST has undertaken preparation of a joint Federal/State Environmental Impact Statement with the State of Hawaii. Similar arrangements are anticipated with other proposed commercial launch sites. The introduction of different vehicles, payloads containing biological materials, new substances, and hazardous materials, and their return to earth raises new environmental issues that will be addressed by this research.

3. Orbital Safety ($150)

Increased use of space--more payloads with the trend toward smaller, less expensive satellites in low earth orbits, larger space structures such as the Space Station, increasingly maneuverable satellites, reentry vehicles, and different uses such as experimental production of both biological and inorganic materials--will increase the potential for collisions and the growth of debris. The Report on Orbital Debris indicates that debris will become a major concern. Because debris is an international problem with commercial dimensions, any regulatory actions must consider the impact on international competitiveness. OCST will determine factors that affect orbital safety and consider various regulatory actions designed to mitigate potential hazards in an international context.

Research in this area will necessarily extend into the foreseeable future because of rapid expansion of the number and type of commercial activities in space. As in other areas, OCST will utilize other agency studies (e.g., NASA, Air Force) to determine the degree of orbital hazards produced by long-term space exposure of satellite systems (e.g., flaking paint, and other debris generation) and the OCST research will focus on appropriate regulatory solutions to these problems.

OCST will develop initial rulemaking for on-orbit operations in FY 1990. Research and international agreements will drive additional rulemaking and regulatory action.

B. SPACE SAFETY SUPPORT AND MANAGEMENT $100

Objectives: To provide support for the administration of OCST licensing, inspection and enforcement program, and for the formulation and management of the research program.

Accomplishments: OCST developed computerized information systems for licensing and other regulatory actions.

OCST developed a computerized full text data retrieval system for space safety documents. The system is capable of key word searches and is comprised of over 1,000 documents for a total of over 75,000 pages.

FY 1989 & 1990 Costs: $375 & $435

FY 1991	FY 1992	FY 1993	FY 1994	FY 1995
$100	$110	$115	$120	$125

License, Inspection and Enforcement Information and Computer Systems ($100)

Increased launch activities will bring increases in license applications, inspections, investigations and enforcement activities. These systems will be used to track and analyze license actions, inspections, violations resulting fines, license suspensions and revocations, identify trends, and determine the most effective inspection and enforcement strategies. Funding is required for its operation.

C. OPERATIONS ($000) $725

Objectives: To protect public health and safety as mandated by Congress in the Commercial Space Launch Act, as amended, through regulation and licensing of launch operations and sites, the monitoring of activities to ensure compliance with established regulations, enforcement, and the issuance of insurance requirements, in a manner which ensures high levels of public safety while permitting innovation and growth in the United States space industry.

Accomplishments:

OCST will have issued licenses for as many as 8 launches in FY 1989 and 25 launches in FY 1990. Many of these licenses include activities involving new on-orbit and space applications.

OCST completed initial phases of the licensing of the Hawaiian spaceport, including evaluation of the proposed spaceport site.

With this increased launch activity spread out over more than a half-dozen launch sites, including mobile launch and retrieval sites, OCST will have completed at least 50 inspections in FY 1990.

OCST will have participated in, or will have led, accident or incident investigations for 2 to 3 launches.

FY 1989 & 1990 Costs: $450 & $575

FY 1991	FY 1992	FY 1993	FY 1994	FY 1995
$725	$925	$1,100	$1,400	$1,900

1. Licensing Review ($375)

New vehicles and payloads, the use of commercial launch facilities and mobile launch and payload recovery sites, and growing concern about orbital operations will increase the complexity of the issues that need to be considered in licensing review. On-orbit activities including placement from geostationary transfer to geosynchronous earth orbit and subsequent stationkeeping and reentry will be considered in the license review process. Although the licensing process will be simplified for established and proven operations, the overall workload of the Office will continue to grow at a significant rate due to the new commercial launch systems and space applications.

2. Inspection Requirements ($250)

Twice as many launches (up to 40) are expected for FY 1991 over FY 1990. Every effort will be made to inspect as many launch vehicles, payloads and operations, and facilities as possible on a single inspection trip. Because of the need to inspect during various critical phases of preparation, however, it is anticipated that at least 40 inspection trips will be required. During the last two years, several launch systems of new design will have become operational or nearing operation. It will be important for OCST to establish its authority during this developmental stage of the industry. Commercial ranges will also be nearing operation by this time, perhaps including some abroad, further increasing the burden of inspections. By this time, OCST will be inspecting activities related to on-orbit operations. OCST will use contractor support extensively, and interagency support, where appropriate, to conduct these inspections because of its small staff.

3. Accident/Incident Investigation Support ($100)

The National Transportation Safety Board (NTSB) will be the lead investigating organization in most commercial launch accidents affecting public safety with OCST assuming lead responsibility for investigating incidents. In the event of an investigation under the lead of NTSB, OCST would be a "designated party." These funds are required, therefore, for OCST to function in either capacity. The growth of the industry, including new vehicle designs, the start-up of commercial launch ranges, and the appearance of orbital reentry vehicles, increase the likelihood of situations requiring investigation.

D. INDUSTRY POLICY AND PLANNING ($000) $713

Objectives: To encourage, facilitate, and promote commercial space launches by the U. S private sector, as directed by the Commercial Space Launch Act, as amended; analyze current and emerging economic and policy issues facing the U. S. commercial space launch industry in the context of intense foreign competition; forecast markets for commercial space launches for telecommunications, remote sensing, materials processing, science, radiolocation, land mobile satellite, and other payloads; and assess the performance, reliability, availability, and prices of U.S. and foreign commercial launch vehicles.

Accomplishments:

A prototype Space Transportation Analysis and Research (STAR) Database was developed for use in economic and policy analysis of the commercial launch industry.

OCST prepared materials for the Secretary, the Deputy Secretary and the Director of the Office of Commercial Space Transportation on insurance and indemnification, orbital debris, ammonium perchlorate, land remote sensing, launch scheduling, and radio navigation for use at Congressional hearings and at meetings of the National Space Council, the Space Debris Task Force, the Trade Policy Staff Committee, and the Ammonium Perchlorate Allocation Task Force.

FY 1989 & 1990 Costs: $300 & $400

FY 1991	FY 1992	FY 1993	FY 1994	FY 1995
$713	$880	$970	$1,100	$1,200

1. Space Transportation Analysis and Research (STAR) Database ($400)

Building on the prototype system completed in FY 1989 and on the work accomplished in FY 1989 and FY 1990 to develop the ongoing system, OCST will continue development of the STAR Database. The system will provide information on the commercial space launch industry for use in economic and policy analysis.

In light of the intense foreign competition facing the U.S. commercial space launch industry, OCST requires a comprehensive, coherent, and accessible means of obtaining comparable information on a variety of U.S. and foreign launch systems, components, and payloads. The Database will enable OCST to monitor, assess, and evaluate developments in this dynamic, high-tech industry in the context of U.S. space commercialization policies and programs.

2. International Competition ($133)

OCST will identify and evaluate foreign launch systems and investigate their marketing, production, and launch capabilities, prices, and costs. OCST also will assess research and development, labor, technology, integration facilities, launch pads, and telemetry services. Research will identify and assess the factors influencing the present and future competitiveness of U.S. and foreign launch systems. OCST shall utilize the findings and conclusions of the analysis to monitor and evaluate the industry in order to help encourage, facilitate, and promote commercial space launches by the U.S. private sector.

3. Market for Space Launches ($180)

Research will assess the demand for space launch services. Specifically, it will address short- and long-term trends in telecommunications, remote sensing, materials processing, radiolocation, land mobile services, and science payloads. OCST shall use the findings and conclusions of the assessment to anticipate the evolving relationships between demand for, and supply of, launch services and to structure the Office's promotional activities.

E. PROGRAM SUPPORT ($000) $50

Objectives: To provide an exchange of information and ideas between various government agencies, the commercial industry, educational institutions, and respective private sector organizations in an effort to promote the U.S.

commercial launch industry; and to foster international dialogue and cooperation regarding such issues as orbital operations, payload safety and debris generation.

Accomplishments:

OCST has sponsored two symposia. The first one was held at George Washington University and addressed "The Future of the U.S. Space Transportation Industry." Cape Canaveral, Florida, was the site of the second symposium and provided data on risk to worldwide space launch insurance companies to assist in determining insurance levels. Both of these symposia received considerable praise from industry and government.

During FY 1990, several space symposia were conducted in conjunction with the National Aeronautics and Space Administration and other organizations to heighten public awareness of this new era in space.

FY 1989 & 1990 Costs: $50 & $50

FY 1990	FY 1992	FY 1993	FY 1994	FY 1995
$50	$105	$110	$115	$120

1. Industry Activities ($30)

In an effort to promote the commercial space launch industry, in accordance with the Commercial Space Launch Act, as amended, and increase the awareness of the OCST program, activities will include conferences and meetings involving business and industry groups. The necessary tools to accomplish these tasks include graphics and written information depicting the licensing, inspection and enforcement programs, and presenting the capabilities of the Space Transportation Analysis and Research Database. Plans for a media outreach project include a teleconference focusing on financing commercial space initiatives directed to respective business and financial leaders throughout the nation, featuring the Secretary of Transportation and other DOT officials.

2. Public Liaison Activities ($20)

Increased attention has been directed to the commercial space launch industry in the popular press. As a result, OCST has been faced with additional inquiries from the press and general public. OCST will capitalize on this interest by reaching out to the print and electronic media, as well as educational and community groups through conferences, workshops, and meetings.

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

TRANSPORTATION PLANNING, RESEARCH, AND DEVELOPMENT

For necessary expenses for conducting transportation planning, research, and development activities, including the collection of national transportation statistics, and university research and internships, to remain available until expended, [$6,850,000] $4,047,000. (Department of Transportation and Related Agencies Appropriations Act, 1990.)

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

TRANSPORTATION PLANNING, RESEARCH, AND DEVELOPMENT

PROGRAM AND FINANCING (in thousands of dollars)

Identification Code 69-0142-0-1-407		1989 Actual	1990 Estimate	1991 Estimate
Program by activities:				
	Direct program:			
00.01	Transportation policy and planning....	2,766	3,255	3,847
00.02	University research and internships...	167	262	200
00.03	Office of Commercial Space Transportation.....................	2,569	3,553	—
00.91	Total direct program..............	5,502	7,070	4,047
01.01	Reimbursable program..................	11,421	5,400	6,000
10.00	Total obligations.................	16,923	12,470	10,047
	Financing:			
11.00	Offsetting collections from: Federal funds......................	-11,421	-5,400	-6,000
17.00	Recovery of prior year obligations....	-103	—	—
21.40	Unobligated balance available, start of year.....................	-120	-322	—
24.40	Unobligated balance available, end of year.......................	322	—	—
39.00	Budget authority..................	5,600	6,748	4,047
Budget Authority:				
40.00	Appropriation.........................	5,600	6,850	4,047
40.00	Reduction pursuant to P.L. 101-164....	—	-21	—
40.00	Reduction pursuant to P.L. 99-177....	—	-81	—
43.00	Appropriation (adjusted)..........	5,600	6,748	4,047
	Relation of obligations to outlays:			
71.00	Obligations incurred, net.............	5,502	7,070	4,047
72.40	Obligated balance, start of year......	3,346	4,541	5,061
74.40	Obligated balance, end of year........	-4,541	-5,061	-3,388
78.00	Adjustments in unexpired accounts.....	-103	—	—
90.00	Outlays...........................	4,203	6,550	5,720

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

TRANSPORTATION PLANNING, RESEARCH, AND DEVELOPMENT

PROGRAM AND PERFORMANCE

This appropriation finances those research activities and studies concerned with planning, analysis, and information development needed to support the Secretary's responsibilities in the formulation of national transportation policies.

The program is carried out primarily through contracts with other Federal agencies, educational institutions, nonprofit research organizations, and private firms.

Transportation policy and planning. — This research supports the development of transportation policy, coordination of national level transportation planning, and such issues as regulatory modernization, energy conservation, environmental and safety impacts of transportation. Beginning in late 1990, the Department will establish a user fee for the electronic tariff filing program.

University research and internships. — This activity provides assistance to colleges, universities and their students to conduct research in the field of transportation. Special emphasis is placed on assisting historically Black colleges and universities in taking part in transportation research and aiding minority students in preparing for careers in transportation.

Commercial Space Transportation. — This activity will be funded under a separate account in 1991.

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

TRANSPORTATION PLANNING, RESEARCH, AND DEVELOPMENT

OBJECT CLASSIFICATION (in thousands of dollars)

Identification Code 69-0142-0-1-407		1989 Actual	1990 Estimate	1991 Estimate
	Direct obligations:			
	Personnel compensation:			
11.1	Full-time permanent	1,840	1,771	1,325
11.3	Other than full-time permanent	159	176	127
11.5	Other personnel compensation	19	42	33
11.9	Total personnel compensation	2,018	1,989	1,485
12.1	Personnel benefits: Civilian	238	287	197
21.0	Travel and transportation of persons	39	44	24
23.3	Communications, utilities, and miscellaneous charges	—	40	41
24.0	Printing and reproduction	—	35	40
25.0	Other services	3,205	4,657	2,240
26.0	Supplies and materials	2	9	10
31.0	Equipment	—	9	10
99.0	Subtotal, direct obligations	5,502	7,070	4,047
99.0	Reimbursable obligations	11,421	5,400	6,000
99.9	Total obligations	16,923	12,470	10,047

PERSONNEL SUMMARY

Total number of full-time permanent positions	33	33	23
Total compensable workyears:			
Full-time equivalent employment	35	36	26

TRANSPORTATION PLANNING, RESEARCH, AND DEVELOPMENT

FY 1991 Request by Budget Activity and Major Program

	FY 1990	FY 1991
	($000)	
I. Transportation Policy and Planning	$3,014	$3,847
A. Developing and Coordinating Transportation Regulatory Policy	366	450
B. Developing and Coordinating International and Domestic Transportation Policy	290	620
C. Developing and Coordinating Transportation Economic Policy	360	770
D. Airline Tariffs Automation System	200	200
E. Salaries and Administrative Costs	1,798	1,807
II. University Research Program	262	200
Total Appropriation	$3,276	$4,047

In the program justifications, costs after 1991 are shown for the purpose of indicating the extent of a program or its estimated costs if it should be continued. These estimates do not represent a request for future resources and do not necessarily constitute our entire outyear planning estimates.

JUSTIFICATIONS

OFFICE OF THE SECRETARY OF TRANSPORTATION

TRANSPORTATION PLANNING, RESEARCH, AND DEVELOPMENT
($ in Thousands)

I. TRANSPORTATION POLICY AND PLANNING $3,847

A. Developing and Coordinating Transportation Regulatory Policy $450

Objectives: To maintain a continuing assessment of the safety, financial condition and regulatory impact on the components of the nation's private transportation sector including manufacturers, carriers, shippers and suppliers. To develop and recommend proposed policies and legislation dealing with the private sector. To establish and maintain liaison with the private sector and its labor components, and include their views in the Departmental policy deliberations. To evaluate proposed legislative and regulatory actions for their benefits or adverse impacts on the industrial sector.

Accomplishments: Led DOT analysis and development of major legislation affecting trucking, household goods, coal pipelines, intermodal shipping, and rail, bus, regulatory reform; monitored the impacts of these and other legislation on the trucking, rail and airline industries and their users; and in the monitoring of structural changes in the intercity bus industry. Developed options to terminate most ICC regulatory responsibility and transfer essential functions to other agencies. Supported state efforts to reform economic regulation of intrastate trucking. Successfully supported the ICC's efforts to redefine the scope of interstate commerce in particular cases to reduce burdensome state regulation of interstate shipments. Analyzed major rail acquisitions or reorganizations and provided views to the ICC. Initiated development of a national strategic transportation plan. Developed policy initiatives to improve numerous aspects of transportation safety and monitored the implementation of those initiatives by regulatory action. Regulations covered all transportation modes, including safety belts and airbags for automobiles, front wheel brakes for trucks, commercial vehicle driver licenses, aircraft cabin flammability, aviation terminal control areas, automatic train control devices and post- accident drug and alcohol testing for marine accidents. In aviation security, monitored the tightening of airport screening and surveillance systems in the U.S. and overseas.

FY 1989 & 1990 Costs: $ 35 and $366

FY 1991	FY 1992	FY 1993	FY 1994	FY 1995
$450	$450	$450	$450	$450

FY 1991 PROPOSED STUDIES

Assessing Alcohol and Drug Impact on Transportation Safety ($200)

This research will bring together information and experience resulting from research by the Operating Administrations and from the Department's anti-alcohol and anti-drug regulations in order to assess the need and prospects for further action in this area.

In the past few years, the Department has issued regulations that significantly tighten the restrictions on the use of alcohol by transportation operators and initiate a campaign to achieve a drug-free transportation workplace. In addition, several Operating Administrations have recently initiated research on operator performance that may shed further light on alcohol and drug effects.

By the start of FY 1991, the anti-alcohol regulations will have become operational, the anti-drug initiatives should have cleared the various legal hurdles, and the various research efforts should be producing results. Because of the heightened general interest in the threat from alcohol and drugs, there will be advancements in knowledge throughout the scientific community. The time will be ripe to review the accumulating information and experience on alcohol and drugs, and to array that information in a manner to aid in decisions on future anti-alcohol, anti-drug initiatives.

The proposed research will be aimed at answering three major questions: 1) what form would an alcohol testing program take similar to that put in place for drugs and how should it be structured; 2) is there a need for further action to combat the threat to transportation from use of illicit drugs; and 3) is there a threat from illicit drugs or other factors affecting operator performance that requires DOT action?

Impact of Intrastate Trucking Regulation ($50)

Some of the benefits of trucking deregulation have not yet been obtained, because of the persistence of economic regulation of trucking by the states. Better estimates of the costs imposed by intrastate regulation on the economy as a whole are needed, in order to evaluate the impact of intrastate regulation of trucking. New data have recently become available that would allow a more accurate comparison of interstate versus intrastate truck rates for a sample of major shippers. Previous studies lacked systematic data on how much traffic moved at each rate, and hence produced somewhat arbitrary averages of rate levels in particular markets. The more accurate estimates of the costs imposed by intrastate trucking regulation available from this study would provide significant support for our proposed additional economic deregulation of trucking, which would include preemption of state regulation.

International Aviation Security ($200)

International security procedures have evolved over time as it became necessary to respond to new forms of threat. The need for these procedures, and the form they take, is the result of a complex interaction between U.S. foreign policy and those who oppose that policy to the point where the heinous targeting of U.S. civil aviation becomes their instrument for recourse.

The purpose of this project is to take a long range view of the overall threat/countermeasure/vulnerability/risk milieu, with the intent of increasing overall effectiveness of the FAA security program through changes at the international aviation policy level. The initiatives that would be sought would be grounded in previously unexamined areas, such as new augmenting roles for CRS systems and machine readable passports; uniform international standards for background checks and control of ground personnel; an international structure that licenses, certifies, and grades security job classifications; and utilization of all federal programs information systems. Also included would be analyses of the role of the various international bodies through which we work (e.g. ICAO) and their functioning in different aspects of security implementation.

B. Developing and Coordinating International and Domestic Transportation Policy $620

Objectives: Provide Departmental leadership on international transportation issues and assess their economic, financial, technological and institutional implications for U.S. transportation carriers and trade potential. Conduct the Department's program to assure that U.S. air transportation companies are economically fit.

Accomplishments: Conducted negotiations/discussions relating to motor carrier, maritime, and other policy issues with Canada. Coordinated interagency efforts on Mexican motor carrier issues and participated in discussions with Mexico. Conducted maritime negotiations and discussions with China, the Soviet Union, Japan, Peru, Korea, Columbia, and the countries of the Consultative Shipping Group. Coordinated transport-related aspects of the Caribbean Basin Initiative. Provided comment on and analysis of transport-related trade issues for the Economic Policy Council and the Trade Policy Review Group, with principal areas of interest being services, aircraft, standards and government procurement. Managed transport-related issues raised in negotiations on the Uruguay Round of the GATT talks. Participated in discussions on electronic data interchange, transportation facilitation, multimodal transport, and road research in various multilateral fora. Coordinated Departmental involvement in international civil aviation security issues.

The International Air Transportation Act of 1979 instructs the U.S. Government to seek the most competitive operating environment possible, consistent with efficient and economic international service. This requires a pragmatic, case-by-case approach when negotiating with our aviation bilateral trading partners; an approach which focuses particularly on the actual operating environment in individual country markets. Accordingly, during Fiscal Year 1989, in approximately 43 negotiations with 29 individual countries, extensive data and economic analyses were required and conducted.

The Senate Committee on Appropriations directed the Department of Transportation to produce a study that makes assessments of the alterations in traffic patterns that new long-range aircraft will create and of the subsequent development of international hubs to accommodate the range characteristics of these aircraft.

The staff prepared exhibits and testimony for international aviation carrier selection proceedings and acquisition and enforcement cases that are set for oral evidentiary hearings before a Departmental Administrative Law Judge.

The cases include: the U.S.-Australia Service Proceeding, and the U.S.-Mexico All-Cargo Case.

The Department also analyzed carrier submissions in one non-hearing case: U.S.-Argentina All-Cargo Exemption Case.

A Departmental Task Force was established to determine the immediate effects on the traveling public of the strike against Eastern Airlines.

Section 401 of the Federal Aviation Act provides that before engaging in air transportation operations, companies (with the exception of on-demand air taxi operators) must be found fit, willing, and able by the Department to conduct their proposed operations. During the first eight months of FY 1989, we found 24 carriers fit to perform air transportation services and dismissed the applications of 12 companies. Section 401(r) of the Act further provides that, once a carrier has been found fit initially, it must continue to remain fit in order to retain its air transportation authority. During the first eight months of FY 1989, 41 continuing fitness reviews of air carriers were instituted.

FY 1989 and FY 1990 costs: $436 and $290

FY 1991	FY 1992	FY 1993	FY 1994	FY 1995
$620	$620	$620	$620	$620

FY 1991 PROPOSED STUDIES

Data Collection and Processing of International Airlines Passenger Data ($400)

Immigration and Naturalization Service I-92 statistics are a principal source of U.S. international air passenger statistics for both U.S. and foreign airlines and the U.S. Government's sole source of foreign carrier scheduled passengers in the U.S. market. The I-92 data base is widely used by government, industry and the general public to ascertain the volume of air traffic, citizenship composition and the competitive market share of U.S. airlines. Specifically, the DOT needs to have the data to prepare positions for aviation bilateral negotiations, international selection cases and airline acquisition cases. To a large extent, this objective is accomplished through data collection, data base management, data processing and report generation of the I-92 forms. When DOT's T-100 new airline reporting system is fully implemented, the Department will no longer require the I-92 statistics.

International Aviation Study ($220)

The formulation and implementation of U.S. international aviation policy are major responsibilities of the Office of the Assistant Secretary for Policy and International Affairs. These responsibilities are performed through bilateral and multilateral negotiating initiatives, regulatory actions and coordination with other U.S. government agencies, Congress, the airline industry, communities and the traveling and shipping public. The international aviation environment is a rapidly changing one as a result of foreign government political, economic and social actions, equipment and technology improvements, new marketing practices and shifting consumer preferences. For example, the integration of the European Community in 1992, the expansion of computer reservation systems in foreign markets and the significant increase in demand for U.S.-Asia air services are all expected to heavily impact U.S. international aviation policy implementation. To assist Policy in the performance of its international aviation responsibilities, this study will review developments in these areas, focusing on the state of international aviation competitive environment. Governing bilateral and multilateral regimes, as well as relevant U.S. and foreign governmental actions will be reviewed. Extensive data collection analyses of entry, capacity, pricing practices and passenger traffic also will be required.

C. Developing and Coordinating Transportation Economic Policy $770

Objectives: To identify current and emerging transportation policy issues that require decisions by top management; to analyze their economic and institutional implications; and to develop program recommendations. To be particularly concerned with: (1) the character and impact of Federal financial assistance, investment in and regulation of public transportation facilities and services, trust funds, and user charges; and (2) the economic efficiency of the national transportation system, energy, environmental, and other issues involving the relationship of transportation policy to national economic goals and community development.

Accomplishments: The National Transportation Strategic Planning Study (NTSPS), which was required by the 1988 Department of Transportation Appropriations Act, was begun in 1988. The Act called for a long-range, multimodal study to the year 2015 for transportation facilities and services to carry persons and goods. Detailed analyses of urban areas included are: New York, Philadelphia, San Francisco/Sacramento, Washington, D.C. and Nashville. The report is to be submitted to the Congress by March 1990. The national portion of the study is being conducted by our office, with the assistance of Transportation Systems Center (TSC). The urban areas studies are being conducted by local planning agencies and will be summarized in the final report. The NSTPS is employing data, analyses and forecasts developed both within and outside the Department of Transportation, with modifications as needed.

To reduce airline delays, we implemented the new airline on-time disclosure rule (14 CFR Part 234), prepared monthly Consumer Reports on the airlines' performance, and conducted several internal analyses of the detailed flight data to analyze airline operations and airport congestion. The on-time ratings are widely used and the rule is providing a very effective market incentive to cut delays and insure accurate flight schedules. The United Kingdom recently announced that it will follow the U.S. lead in setting up an airline performance disclosure rule, and other foreign governments (from Japan to Saudi Arabia) are now studying the system we designed.

We also provided substantial policy guidance and analytical support on the Boston Logan Airport Landing Fees Case, as well as analytical assistance for inter-carrier scheduling discussions to reduce congestion at O'Hare. In addition, we designed and provided technical analyses to evaluate DOT enforcement action on the airline delay problem.

We analyzed the effect of imposing gross receipts fees on off-airport car rental companies. This study, entitled A Review of the Imposition of Gross Receipts Fees on Off-Airport Car Rental Companies, described the growth in the number of airport car rental companies that operate off airport property, as well as the number of airports that have imposed gross receipts fees on these firms. The study also examined the legality of these fees and the extent to which airports rely upon them.

At the request of Senator Danforth, the Department prepared a report (A Comparison of Air Fares and Services at St. Louis Before and After Trans World Airlines Acquired Ozark Airlines) on the impact of TWA's acquisition of Ozark Airlines on airline fares and services at St. Louis. The study also assessed the nature of barriers to entry at St. Louis International Airport.

The Department is preparing a report to Congress on Intelligent Vehicle/Highway Systems (IVHS). The purpose of the report will be to assess ongoing European, Japanese, and U.S. IVHS research initiatives; analyze the potential impacts of foreign IVHS programs on the introduction of advanced technology for the benefit of U.S. highway users and on U.S. vehicle manufacturers and related industries; and make appropriate legislative and/or programmatic recommendations. We have prepared a discussion paper (Discussion Paper on Intelligent Vehicle/Highway Systems) and opened a public docket to receive public comments on this issue. We shall use the results of the public comments to prepare our report and to make recommendations on the federal government's role.

As part of the Department's comprehensive review of airline competition, we are examining the effects of airline-owned computer reservation systems on competition in the air travel industry. This study will allow us to update our May 1988 report on the CRS industry, will assist us in evaluating whether the existing CRS rules need to be modified, and will help us understand the relationship between travel agents and CRS vendor airlines and how this relationship influences competition among air carriers.

As part of the Department's review of airline competition, we are analyzing the state of competition in the regional airline industry. This study will assess how competition has changed in the 300 largest regional markets between 1983 and 1988. We also plan to examine the changing characteristics of the regional industry, especially traffic growth, composition of the fleet, and service to alternative hub airports.

We have prepared several papers on the financial condition of the airline industry and problem air carriers. We will also be involved in analyzing ongoing international airline route cases.

We completed a report on fatigue, entitled Transportation-Related Sleep Research, in response to the Senate Report on the Department's 1989 Appropriations Act. The Act requested that the Secretary of Transportation prepare a comprehensive report that describes current Departmental activities in all modes regarding the role of fatigue, sleep disorders and sleepiness in transportation. This report examines the role of fatigue or sleepiness in transportation accidents in all modes, discusses some specific findings from the National Transportation Safety Board and Insurance Institute for Highway Safety, presents recommendations from experts in the field of sleep research, and summarizes recent and proposed Department of Transportation research on sleepiness, fatigue and inattentiveness in transportation.

The Department currently is examining changes in work rules, work shifts, and work environments for air traffic controllers, truckers, train crews and others. The steps taken to date, as well as ongoing research in the Department and elsewhere, including the development of various monitoring devices, are expected to reduce the frequency of sleep-related incidents and fatalities.

FY 1989 and FY 1990 costs: $105 and $360

FY 1991	FY 1992	FY 1993	FY 1994	FY 1995
$770	$770	$770	$770	$770

FY 1991 PROPOSED STUDIES

Economic Impact of Intelligent Vehicle-Highway System ($320)

Government and industry in Europe and Japan have major technological feasibility programs underway to develop and implement Intelligent Vehicle-Highway Systems (IVHS). The United States is considering initiating such a program. Often referred to as "smart cars" and "smart highways," IVHS technology represents the marriage of the vehicle, the driver, and the highway.

The ultimate goal of IVHS is to make automobile traffic safer, more efficient, more energy efficient, and more environmentally benign. Successful development and use of this technology may eliminate some of the more onerous, difficult, and dangerous driving tasks in much the same way that earlier innovations like automatic transmissions, cruise control, and freeways have improved driving and highway safety. Expected benefits of IVHS include reduced road congestion, increased capacity of the existing road infrastructure (without major additional lane mileage), reduced highway deaths and injuries, and reduced property damage associated with accidents.

In the commercial sector, benefits could come from the use of IVHS technology to improve on-time delivery performance. IVHS technology may also reduce the costs associated with compliance of regulations that pertain to vehicle registration, permits, size and weight, operating hours, taxes, and vehicle safety. It is also hoped that IVHS technology will help alleviate truck-related congestion in urban areas, especially traffic delays caused by truck accidents.

Despite the anticipation that IVHS technology systems will be used in the United States (either through domestic development or imported from abroad), relatively little analysis has been undertaken on which IVHS technology will provide the benefits promised. Analysis should begin to determine the likely economic and societal impacts of this technology. Analysis should also be conducted on a number of economic issues that have been identified but not analyzed, including intergovernmental jurisdiction, insurance, and legal liability.

The types of issues to be addressed in this study would not duplicate those conducted by the operating administrations. The focus of this study cuts across the individual responsibilities of FHWA, NHTSA, and UMTA. In addition, it is desirable for these broader reviews of economic and societal impacts to be conducted independent of the immediate operating program responsibilities and goals.

Alternative Fuels and Transportation ($170)

Wide-ranging proposals for shifting transportation modes from petroleum to alternative fuels are being made by Congress, Executive Branch agencies, and state and local governments. The impetus for the proposals comes from environmental and energy security concerns.

There appears to have been little emphasis on the costs to the transportation sectors in the development of many of the proposals; the primary focus has been on benefits to the environment and to energy security. There also has been little comparison of alternative fuel proposals with other possible approaches to reducing the environmental and energy security costs associated with transportation.

This study would survey the various alternative fuels, and some of the major proposals for bringing them into use. The study would examine the costs and benefits of the proposals, with emphasis on their transportation impacts and would identify and analyze other possible approaches. This study would support DOT participation on the Interagency Alcohol Fuel Commission and in Economic Policy Council and Domestic Policy Council deliberations on transportation-related energy and environmental issues. It would support the Department's participation in the President's proposed Clean Air Act initiative, which includes the use of oxygenated fuels to control carbon monoxide emissions and replacing a portion of the motor vehicle fleet with new vehicles that operate on clean burning alternative fuels.

Airport Capacity Analysis ($280)

There is a major concern that many of our existing airports do not have sufficient capacity to handle current, as well as projected, congestion and that the prospects for providing new capacity through new construction are very limited in the next decade or so. Further, the financial requirements to meet this added capacity requirement are unresolved.

This project will focus on the application of tools and data to address specific policy options including: congestion pricing and capacity increasing investments; alternative mechanisms for ensuring adequate revenues to finance needed improvements; altering the criteria used in prioritizing airport grant requests and proposing modifications to current rules and statutes that control the distribution of federal airport improvement funds; assessing the degree to which current airline operating patterns, such as the establishment of hub and spoke systems, are affecting overall airport congestion problems and whether altering those patterns can result in significant improvement in airport capacity utilization; the potential benefits and economic viability of remote airport transfer terminals, so-called wayports; and potential benefits to airport operations and overall system capacity from shifting general aviation and commuter airline operations out of highly congested air carrier hub airports to less congested reliever facilities.

D. Airline Tariffs Automation System $200

Objectives: The Department is currently in the process of converting from a paper tariff filing system to an electronic tariff filing system. This system, when fully operational, will significantly improve the Department's capability, productivity and responsiveness in handling tariffs in a more cost effective and expeditious manner than currently required in our paper based media. The program also will enhance the Department's ability to handle the ever increasing volume of tariff submissions with little or no additional manpower and will rebound to the benefit of the aviation community at large. This conversion to an electronic system represents the most significant modification to the aviation tariff filing environment since its inception in 1938. The program will also provide substantial cost savings to the industry and the government.

Accomplishments: Our program to convert from paper to electronic filing formally began in August 1985 with an Advance Notice of Proposed Rulemaking. Based on the comments we received in response to this notice, we decided to proceed toward development of a fully integrated on-line electronic tariff filing system.

We established an Advisory Committee to aid in the process. The Committee has since made two recommendations to the Department. The first was to amend the tariff posting regulation to allow airlines to use electronic means to post tariffs at their world-wide sales locations. The second was to experiment with existing industry systems and software. The Department has adopted both of these recommendations, the first through a final rule issued at the end of 1988, and the second through experiments that are continuing.

In December 1987 the Airline Tariff Publishing Company petitioned the Department for a rulemaking that would permit electronic filing of passenger fare tariffs. The petition was premised on the need to provide some near-term interim relief from the burdens associated with a paper filing system.

In January 1989 we adopted a final rule that provides this interim relief. We have begun procuring and installing equipment to implement this relief.

Meanwhile, we are continuing with our longer-term automation efforts for the development of a fully integrated on-line electronic tariff filing system.

We are on target with the overall program and expect by the middle of this summer to start receiving electronic filings under the interim steps we have taken.

These filings will be subject to a filing fee of 5 cents per record. Our final electronic tariff rule indicated that we would be prepared to review this initial fee based on actual experience after the program begins to function.

We estimate that our interim steps authorizing electronic filing will save the industry some 40 million dollars annually.

FY 1989 and FY 1990 costs: $300 1/ and $200

FY 1991	FY 1992	FY 1993	FY 1994	FY 1995
$200	$200	$200	$250	$260

1/ FY 1989: $300K in TPR&D and $200K in "M" S&E ADP budget

E. Salaries and Administrative Costs $1,807

Proposed: To accomplish the policy objectives of the TPR&D research budget, a total of $1,807,000 is requested for FY 1991, with $1,682,000 for personnel compensation and benefits to support the on-board full-time equivalents, to annualize the FY 1990 pay raise, to fund 50 percent (the remainder is absorbed) of a 3.5 percent pay raise effective January 1991 and the executive pay raise, and to fund normal within-grade and merit pay increases. Due to absorption of the pay raise in FY 1990, in order to fund on-board FTEs, it may be necessary to delay hiring for some unfilled positions and/or to reprogram funds from "other costs."
(2) The remaining $125,000 is requested for travel to monitor the progress of the projects and studies by contractors and to gather data on transportation industry issues of various transportation industries; administrative support costs for increased ADP for aviation data at TSC to support bilateral aviation negotiations and aviation data in connection with future flight delay investigations, computer reservation system, and data for hearings and findings in merger cases; rents and communications associated with prorated cost of OST offices use of library and visual services; printing and reproduction of departmental analyses relating to international aviation policy and the air carrier industry, as well as preparation of filings for the regulatory commissions; and supplies, materials and word processing equipment for professional and secretarial staff.

FY 1989 and FY 1990 costs: $1,890 and $1,798

II. UNIVERSITY RESEARCH $200

Objectives: The University Research Program is a Department-wide effort which takes advantage of the wealth of talent available in the Nation's universities to perform research in support of DOT missions. The purpose of the program is to assure that resources of the higher education community are effectively brought to bear on transportation problems. The operating administrations and the Office of the Secretary are involved in all phases of the program including determining research needs, proposal evaluation and selection, contract monitoring, and application of research results. The program is the central link between DOT and the university community.

Accomplishments: A representative set of specific research accomplishments arranged in the four areas under the Program of University Research and a discussion of how the research results are disseminated follows.

Transportation Investment and Financing - Massachusetts Institute of Technology applied life-cycle costing to highway maintenance and discovered that a comprehensive analysis of pavement investments could reduce total service costs. A study by Iowa State University explained a way to gain economic benefits by abandoning low volume rural roads and bridges while guaranteeing access to property by local citizens. California State University at Long Beach completed research which reveals that close private/public cooperation can improve the flow of goods through ports. Research at Harvard University indicates that more sophisticated highway investment rules could significantly improve the benefits that accrue to funding agencies and highway users. Northwestern University, in developing a model to forecast the effects of transportation investments, found that transportation does have an impact on housing and land values and that the benefits can be captured by a special assessment tax.

Transportation Regulation - A study by North Carolina A&T State University disclosed that regulatory reform in the motor carrier industry has produced new levels of competition and new opportunities for shipper cost savings. Oregon State University investigated the impact of state regulation of motor carriers on interstate transportation, and specifically examined whether the existence of regulation in the states of

California, Oregon, and Washington exerts additional costs on both carriers and shippers in interstate commerce. The University of Pennsylvania reviewed state economic regulation in those approximately 40 states over entry and rates in the trucking industry. The hypothesis in both studies is that strong entry controls may inhibit some regional and national carriers from participating in intrastate markets which would help them operate more efficiently in their interstate operations.

Transportation Safety - The University of Illinois at Chicago developed a course on Motor Vehicle Trauma. The improved handling of trauma in accident victims is expected to save hundreds of lives over the next 20 years. A study at Western Kentucky University on the self-heating of coal in river barges contributed to the reduction of fires on board barges in the Mississippi River. Research on impacts of children's safety seat legislation by the University of California at Irvine determined that both the number and severity of injuries went down after the law was enacted. Kansas State University developed manuals to help small communities handle hazardous materials emergencies and cope with the threat to life, property and environment from the transportation of hazardous materials.

Transportation Technology - North Carolina State University investigated tire/pavement interaction and provided fundamental knowledge concerning tire excitation mechanisms, vibration, acoustic radiation and skid characteristics. This information will be used by tire manufacturers to lower the problem noises associated with truck tires. Research performed by Lehigh University on fatigue strength of weathered and deteriorated riveted members on bridges produced new information which is being used to determine the remaining life of bridge components. Washington State University has proven that parallel computers can vastly increase the speed of processing large-scale transportation network optimization problems.

FY 1989 and FY 1990 costs: $167 and $262

FY 1991	FY 1992	FY 1993	FY 1994	FY 1995
$200	$200	$200	$200	$200

FY 1991 PROPOSED STUDIES

The increased funding in FY 1991 is primarily to reestablish the University Research Program to work on the important transportation issues which will be facing the Department in the 1990's. The Nation is at a critical juncture in setting forth a strategic transportation policy, and universities are needed to help provide a strong knowledge base for policy development and for resolving important transportation problems. The thrusts in FY 1991 will include ones such as transportation labor force assessments, land use, human factors, transportation capital markets, multi-modal transportation facilities, aviation security, intelligent vehicle highway interface, international competitiveness, alternative fuels, changing demographics of an aging population, and transportation technology. The program will focus on the fundamental, long-range, and multi-modal aspects of the problems. The program solicitation and the university awards will be approved annually by the Deputy Secretary of Transportation.

The University Research Program has a strong technology transfer effort and disseminates a wide range of research results to transportation practitioners in the Department, state and local government, industry and academia. Technology transfer is accomplished by conducting seminars and workshops, linking key professionals, fostering computer networks, promoting intellectual interchange, sharing by facsimile transmittal, publishing reports, answering requests for technical assistance, fostering outreach programs, presenting papers at conferences, developing user manuals, furnishing material through practitioner mail lists and exchanging ideas with other technology transfer programs.

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

PAYMENTS TO AIR CARRIERS

For payments to air carriers of so much of the compensation fixed and determined under section 419 of the Federal Aviation Act of 1958, as amended (49 U.S.C. 1389), as is payable by the Department of Transportation, [$30,735,000] $23,600,000, to remain available until expended. (Department of Transportation and Related Agencies Appropriations Act, 1990.)

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

PAYMENTS TO AIR CARRIERS

PROGRAM AND FINANCING (in thousands of dollars)

Identification Code 69-0150-0-1-402	1989 Actual	1990 Estimate	1991 Estimate
Program by activities			
10.00 Section 419 subsidy (Total obligations) (object class 41.0)	25,567	36,909	23,600
Financing:			
17.00 Recovery of prior year obligations........................	-94	—	—
21.40 Unobligated balance available, start of year......................	-140	-6,266	—
24.40 Unobligated balance available, end of year........................	6,266	—	—
39.00 Budget authority.....................	31,600	30,643	23,600

Budget authority:			
40.00 Appropriation........................	31,600	30,735	23,600
40.00 Reduction pursuant to P.L. 101-164...	—	-92	—
43.00 Appropriation (adjusted)............	31,600	30,643	23,600

Relation of obligations to outlays:			
71.00 Obligations incurred, net...........	25,567	36,909	23,600
72.40 Obligated balance, start of year....	1,855	112	6,129
74.40 Obligated balance, end of year......	-112	-6,129	-8,589
78.00 Adjustments in unexpired accounts...	-94	—	—
90.00 Outlays......................	27,217	30,892	21,140

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

PAYMENTS TO AIR CARRIERS

PROGRAM AND PERFORMANCE

The Secretary of Transportation, through powers of delegation and review, now administers the section 419 subsidy program, which was added as part of the Airline Deregulation Act of 1978. Subsidies under this program are paid to airlines—primarily commuter carriers. In 1991, the Department is proposing a five-year phase-out of this program, building on the service reductions initiated in 1990.

PAYMENTS TO AIR CARRIERS

SUMMARY STATEMENT
($000)

FY 1990 Appropriation	FY 1991 Estimate	Difference
$30,643	$23,600	$ - 7,043

Office of Essential Air Service (EAS)

This appropriation provides funds for the payment of subsidy to air carriers under Section 419 of the Federal Aviation Act of 1958, as amended by the Airline Deregulation Act of 1978, and Public Law 100-223.

EAS is a transition program following airline deregulation. Our proposal, in keeping with the transition concept, would reduce the program over time by cutting back the most costly subsidy and least isolated areas first.

There are two distinct types of Section 419 compensation. The first (referred to as "hold-in") occurs when a substitute carrier is not immediately available to replace an incumbent that has filed a notice of intent to suspend service. In that event, the Department is required to prohibit the incumbent carrier from suspending service at the community until a replacement is obtained.

The second basic type of Section 419 rate is longer-term compensation. Rates are set for future periods at EAS points where carriers wish to serve, but cannot do so without compensation. This kind of Section 419 compensation is paid to carriers monthly after the Department has solicited proposals to serve a point, has chosen a carrier, and the carrier has provided service.

The $23.6 million requested for subsidies to air carriers in FY 1991 is premised on eliminating additional points from the program. The criteria for implementing such cuts would likely be more stringent than the criteria used for making cuts in FY 1990, a year during which cuts were based on a limit of $200 per passenger and variable mileage limits premised upon size and proximity to alternate air service. Specific changes in criteria for application in FY 1991 are currently being explored. In July 1990, as stated in the Rule, DOT will review the eligibility for subsidy under the current criteria and determine what additional reductions are needed. Included in the FY 1991 budget estimate is $3.1 million to compensate carriers to continue service at points where they wish to cease operations, but are held in.

In FY 1990, subsidized essential air service is being provided at approximately 130 points in the 50 states, Puerto Rico and the Pacific trust territories. The budget estimate for FY 1991 projects approximately 120 points receiving subsidized service. This reflects both the elimination of some additional points from the program and the anticipation that some non-subsidized points will drop below the break-even level and require subsidy while some currently-subsidized points may be approaching profitability and will come off subsidy.

FY 1991
ESSENTIAL AIR SERVICE PROGRAM
ESTIMATE OF PAYMENTS TO AIR CARRIERS
(MILLIONS)

FY 1990 Appropriation	$30.6
Decrease from FY 1990 due to the elimination of 20 points from the program January 1, 1990, effective for the full FY 1991	-1.2
Decrease due to elimination of additional points from the program in FY 1991	-2.4
Estimated inflationary increase over FY 1990	+0.7
Decrease resulting from one-time subsidy (needed in FY 1990 only)	-3.2
Net of points added to/points coming off subsidy rolls from FY 1990	0.0
Changes in hold-in subsidy from FY 1990 levels	-0.9
Total Estimate for FY 1991	$23.6

Note: The $23.6 million requested for subsidies to air carriers in FY 1991 is premised on eliminating additional points from the program.

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

WORKING CAPITAL FUND

[Necessary] For necessary expenses for operating costs and capital outlays of the Department of Transportation Working Capital Fund $10,446,000, together with not to exceed [$137,700,000 shall] $146,809,000 to be paid, in accordance with law, from appropriations made available by this Act and prior appropriations Acts to the Department of Transportation, together with advances and reimbursements received by the Department of Transportation, [and including, for necessary expenses associated with the development of the Departmental Accounting and Financial Information System, $4,500,000,] to remain available until expended. (Department of Transportation and Related Agencies Appropriations Act, 1990.)

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

WORKING CAPITAL FUND

PROGRAM AND FINANCING (in thousands of dollars)

Identification code 69-4520-0-4-407		1989 Actual	1990 Estimate	1991 Estimate
Program by Activities				
	Operating expenses:			
	Publishing and graphics activities:			
00.01	Direct operating expenses........	17,389	13,722	15,460
00.02	Overhead expenses................	617	403	415
	Support services activities:			
00.10	Direct operating expenses........	65,900	81,847	86,933
00.11	Overhead expenses................	2,338	2,408	2,335
	Library services:			
00.20	Direct operating expenses........	2,921	3,022	3,292
00.21	Overhead expenses................	104	89	89
	Transportation computer activities:			
00.30	Direct operating expenses........	29,680	31,233	42,156
00.31	Overhead expenses................	1,053	919	1,132
00.91	Total operating expenses.	120,002	133,643	151,812
	Capital investment:			
	Purchase of equipment:			
01.01	Publishing and graphics activities	1,242	35	12
01.02	Support services activities......	1,363	1,414	798
01.03	Library services.................	—	—	12
01.04	Transportation computer activities	4,853	2,195	4,621
01.91	Total capital investment.......	7,458	3,644	5,443
10.00	Total obligations..............	127,460	137,287	157,255

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

WORKING CAPITAL FUND

PROGRAM AND FINANCING (in thousands of dollars)

Identification code 69-4520-0-4-407		1989 Actual	1990 Estimate	1991 Estimate
	Financing:			
11.00	Offsetting collections from: Federal funds..................	-117,112	-131,664	-146,766
21.90	Unobligated balance available, start of year..................	-12,595	-5,447	-4,265
24.90	Unobligated balance available, end of year....................	5,447	4,265	4,222
39.00	Budget authority	3,200	4,441	10,446
	Budget authority:			
40.00	Appropriation....................	3,200	4,500	10,446
40.00	Reduction pursuant to P.L. 101-164...................	——	-13	——
40.00	Reduction pursuant to P.L. 99-177....................	——	-46	——
43.00	Appropriation (adjusted).........	3,200	4,441	10,446
	Relation of obligations to outlays:			
71.00	Obligations incurred, net........	10,348	5,623	10,489
72.40	Obligated balance, start of year...........................	8,087	13,819	15,001
74.40	Obligated balance, end of year...	-13,819	-15,001	-15,044
90.00	Outlays..........................	4,617	4,441	10,446

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

WORKING CAPITAL FUND

PROGRAM AND PERFORMANCE

The working capital fund finances common administrative services that are centrally performed in the interest of economy and efficiency in the Department.

Services rendered are charged at rates that return in full all operating expenses, including a normal reserve for accrued annual leave and depreciation of equipment. The fund is reimbursed by the operating administrations and offices being served.

The activities of the working capital fund include:

Printing and graphics. — Provides the necessary services needed to support the production and procurement of Department printing and graphics and serves as the production and procurement authority for the Department's graphics, materials, exhibits and photography.

Support services. — Provides for programs such as communications, mail, building management, chauffeur, and security.

Library. — Provides a resource for historical information and aids in the dissemination and exchange of technical and other information.

Transportation computer activities. — Provides the necessary services needed to support information processing services which include networking, processing of data, maintenance applications development, systems management and training.

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

WORKING CAPITAL FUND

OBJECT CLASSIFICATION (in thousands of dollars)

Identification code 69-4520-0-4-407		1989 actual	1990 estimate	1991 estimate
	Direct obligations:			
	Personnel compensation:			
11.1	Full-time permanent	9,985	11,592	12,330
11.3	Other than full-time permanent	304	367	402
11.5	Other personnel compensation	261	389	405
11.9	Total personnel compensation	10,550	12,348	13,137
12.1	Personnel benefits: Civilian	1,500	1,706	1,801
13.0	Benefits for former personnel	1,944	1,200	1,200
21.0	Travel and transportation of persons	261	329	383
22.0	Transportation of things	77	101	203
23.1	Rental payments to GSA	51,020	62,693	65,443
23.3	Communications, utilities, and miscellaneous charges	5,362	10,001	10,622
24.0	Printing and reproduction	10	—	—
25.0	Other services	42,797	40,863	53,252
26.0	Supplies and materials	3,294	2,767	3,051
31.0	Equipment	10,645	5,277	8,163
99.9	Total obligations	127,460	137,287	157,255

PERSONNEL SUMMARY

	1989 actual	1990 estimate	1991 estimate
Total number of full-time permanent positions........................	311	311	319
Total compensable workyears:			
Full-time equivalent employment	320	327	335
Full-time equivalent of overtime and holiday hours...............	3	3	3

WORKING CAPITAL FUND

OFFICE OF THE SECRETARY

	FY 1990 Estimate	FY 1991 Estimate	Difference
Permanent Positions........	311	319	+8
Full-Time Equivalents......	317	325	+8
Obligation Limitation......	$137,287,000	$146,809,000	$ +9,522,000
Budget Authority...........	$ 4,441,000	$ 10,446,000	$ +6,005,000

ACTIVITY DESCRIPTION

The Working Capital Fund (WCF) finances common administrative services that are centrally performed in the interest of economy and efficiency in the Department of Transportation (DOT). Services rendered are charged at rates that return all operating expenses in full, including a normal reserve for accrued annual leave and depreciation of equipment. The Fund is reimbursed by the Operating Administrations and offices being served.

The organizations of the WCF are grouped under five major activities as follows:

Printing and Graphics -	Provides the necessary services needed to support the production and procurement of DOT printing and graphics. In addition, serves as the production and procurement authority for the DOT's graphics, exhibit and photography functions.
Support Services -	Provides the necessary services needed to support the programs of DOT such as communications, mail, building management, chauffeur, security and investigations, etc.
Library -	Provides a resource for historical information and aids in the dissemination and exchange of technical and other information important to the progress of transportation.
Transportation Computer Activities -	Provides the necessary services needed to support information processing services which includes networking, processing of data, maintenance, applications development, systems management and training. Also provides the supplies, hardware and software needed to operate the services.
Overhead -	Provides the administrative support for the WCF activities. Includes personnel, accounting, procurement, etc.

FY 1991 BUDGET REQUEST

The FY 1991 request level of $157,255,000 reflects an increase of $19,968,000 over the FY 1990 budget and includes new budget authority of $10,446,000 for the funding of the Departmental Accounting and Financial Information System (DAFIS); Office of the Secretary of Transportation (OST) Office Automation; Uniform Procurement Management System (UPMS); and Administrative Systems Improvement Program (ASIP). This increase is necessary to allow for mandatory increases; to restore normal level of services, which were curtailed in FY 1990; and to provide for new and expanded services and programs needed by the DOT Operating Administrations.

Mandatory increases amount to $1,157,000. The WCF has no control over inflation, outside vendor increases, pay raises, or merit within grades. All fixed costs of a WCF must be recovered regardless of the level of service provided. Therefore, to avoid reducing the level of service; i.e., our customers receiving less service for a higher price, funding for mandatory increases is requested.

The WCF had to absorb $4,736,000 of the total $11,673,000 increase in Headquarters Space Rental in FY 1990 plus an additional $2,377,000 in other program reductions. The total absorption of $7,113,000 in FY 1990 forced the WCF to curtail its normal level of services provided to the DOT Operating Administrations and defer 5 new major Departmental projects until FY 1991. The WCF must provide the services requested by its customers if it is to keep them as customers. Furthermore, the deferral of the five projects past FY 1991, namely the UPMS, the OST Office Automation, the Executive Information System (EIS), the Optical Disk Imagery and the Uninterruptible Power Source (UPS), will seriously jeopardize the reliability of the WCF's large ADP systems, the integrity of our accounting and procurement systems, and the Department's ability to respond to the industry and public in a timely fashion.

An additional $11,698,000 is needed for the expansion of ongoing programs and the initiation of new programs as requested and required by the DOT Operating Administrations. If the WCF cannot provide the level or quality of service required and demanded by its customers, then our customers will be forced to perform the work in-house which, in most cases, is not feasible; contract the service to a third party which will increase the government's costs and time schedule; or simply not obtain the service which slows down the progress and productivity of government.

We have taken significant steps to put our WCF activities on a business basis and have encouraged DOT elements to use the most cost effective source. If the WCF is forced to provide less service, or less service at a higher price, then the incentive for using a WCF is diminished.

The following outlines our request more specifically by the five major activities:

PUBLISHING AND GRAPHICS - $+1,715,000

Mandatory Increases - $883,000

For nondiscretionary increases for annualization of FY 1990 pay raise; 50 percent funding (the remainder is absorbed) of the 3.5 percent pay raise effective January 1, 1991 and the executive pay raise; funding for normal within-grade and merit pay increases; price increases for supplies and outside contractor work; and Headquarters Space Rental.

New or Expanded Programs and Services

Miscellaneous - $832,000

The increase consists of $500,000 in contracted printing services needed to provide the level of printing and graphics services required by the DOT Operating Administrations in FY 1991. An additional $332,000 is needed to purchase supplies and materials and miscellaneous equipment necessary to improve the quality of services demanded by the DOT Operating Administrations.

SUPPORT SERVICES - $+4,470,000 +4 FTEs

Mandatory Increases - $151,000

The net of non-recurring costs such as one-time equipment purchases and contract services and nondiscretionary increases for funding for annualization of FY 1990 pay raise; 50 percent funding (the remainder is absorbed) of the FY 1991 pay raises; funding for normal within-grade and merit pay increases; price increases for local and long distance telephone services; and Headquarters Space Rental.

New or Expanded Programs and Services

Headquarters Space Design - $436,000 1 FTE

In view of upcoming lease expirations in two of the three Headquarters buildings, DOT and the General Services Administration (GSA) are exploring optional approaches for housing Departmental Headquarters elements in the future. This effort involves future space needs for all DOT Headquarters elements currently located in Nassif, Transpoint and Federal Building 10A (FB-10A).

A Headquarters Space Project Office has been established in DOT to manage the project. It will coordinate all efforts necessary to obtain suitable space from development of requirements to occupancy of the building. Government employees in this office will monitor the efforts of a technical support contractor. The contractor will provide the necessary support to include overall technical project management, economic and financial analysis of building options, development of plans and specifications for building alterations, planning and coordination of personnel and equipment moves. Additional resources of $436,000 for the contract and one FTE for the Project Office are required to perform this work in FY 1991. Resources needed in FY 1990 have been absorbed within existing funding levels. Further absorption cannot be accommodated. Since the Nassif Building lease expired on January 1, 1990, delays in completing the interim and long-term aspects of this project could be extremely costly.

Payroll System Upgrade - $2,000,000

DOT currently operates the Consolidated Personnel Management Information System (CPMIS) and the Consolidated Uniform Payroll System (CUPS) that are used Department-wide to process personnel and payroll actions. CPMIS was implemented in 1975 and CUPS was implemented in 1979. CUPS operates independently of CPMIS but interfaces with the personnel system to obtain personnel information needed to process and pay DOT employees.

Both systems are outdated and several major areas of concern have been identified which will require major systems upgrades or replacement. These include: lack of system responsiveness to management information needs; data discrepancies between the personnel and payroll systems; older and inefficient software used in the systems; increased operational costs; and lack of a labor distribution process in the payroll system.

A DOT personnel/payroll system study was undertaken in 1986 to evaluate the current systems and to make recommendations for resolving current problems and meeting current and future requirements. Based on the study, it was recommended that CUPS and CPMIS be upgraded into an integrated system using the ADABAS/NATURAL commercial database system. The study indicated that this approach would offer the most complete long-term solution to meet both existing and future DOT requirements and would reduce automated data processing costs by about $600,000 annually.

Conversion to an integrated system over a 3 year period was projected to cost $5.1 million in 1986. With increases for inflation, the new projected cost is $6 million. The initial systems development effort during FY 1991 is estimated at $2.0 million.

Integrated Services Digital Network (ISDN) Upgrade - $600,000 3 FTEs

Over the last several years, an internationally agreed-to approach for the handling of voice, data, and video information on an integrated basis has been developed. It is known as the Integrated Services Digital Network (ISDN). Telephone and data communications companies throughout North America, Europe and Japan have already begun to convert their facilities to ISDN standards. GSA's FTS-2000 telecommunications network, which commenced operation in late 1989, is also designed around ISDN standards. ISDN services will, at dramatically lower cost than now possible, permit use of advanced data, facsimile, and video devices in DOT for the transmitting of small to very large volumes of information without special technical arrangements. Funding amounting to $600,000 and 3 FTEs are required for implementation of ISDN services in locations served by the HQ DOT SL-100 Telephone System. In FY 1991, existing HQ DOT telephone equipment will be modified to meet ISDN standards allowing for the removal of existing slow-speed modems and related analog interconnection equipment. Upgrading the HQ DOT Telephone System to meet ISDN standards will provide DOT with the capability to transport all types of information digitally over the facilities of GSA's FTS-2000 Network and other private sector networks, keeping up-to-date with changes and modernization already being implemented in telephone networks worldwide.

Communications Upgrades - $600,000

The SL-100 digital switches resident in DOT Headquarters allow for growth and enhancements through the addition of equipment and software to the original configuration. Normal growth and expanded mission requirements necessitate funding in the amount of $250,000 for this system. Enhancements include the development of video capabilities and use of available networking and high speed data capabilities. The increase will also allow additional users access to the system. Contractor support in the telecommunications area will increase by $350,000. DOT is the second largest government telecommunications user behind the Department of Defense (DOD). Through the use of contractors, DOT will be able to address functions which are currently being selectively neglected, such as: Catastrophic Disaster Planning, User Support, Operational Measurements and Database enhancements.

Miscellaneous - $683,000

Additional funding of $683,000 is necessary to support the following increases: non-capitalized equipment such as investigative surveillance equipment and safes; use of alternate carriers in the delivery of DOT mail correspondence from the distribution units; additional travel for Executive Protection and in support of physical security surveys and inspections across the country; and increases in service contracts for DOD courier service, telephone services, building security, etc.

LIBRARY SERVICES - $ +282,000

Mandatory Increases - $164,000

For nondiscretionary increases for annualization of FY 1990 pay raise; 50 percent funding (the remainder is absorbed) of the FY 1991 pay raises; funding for normal within-grade and merit pay increases; price increases for supplies; and Headquarters Space Rental.

New or Expanded Programs and Services

Modernization Efforts - $118,000

The primary mission of the library is to aid in the administrative, operational and research programs of the Department by making available information, materials, publications and services for ready access, whether the information is current or past, domestic or international. The library has a national responsibility as an integral part of an information network in transportation affairs. Funding amounting to $118,000 is requested to implement much needed and demanded improved library science applications, such as automated indexing and literature searches that utilize advanced equipment and technology and reduce stock space. This modernization effort will result in better service to the Operating Administrations and reduced space costs when fully implemented in FY 1991.

TRANSPORTATION COMPUTER ACTIVITIES - $ +13,415,000 +4 FTEs

Several major initiatives are requested in the Transportation Computer Activity. The Department has a reputation for being slow in responding to questions from central agencies, such as OMB, GSA and OPM, the Congress, and the public. This poor responsiveness can be attributed directly to insufficient automation. In the past, funding for automation has been the responsibility of individual program offices. This approach has left the Department with "Information Islands" and no Department-wide plan for interconnectivity and information sharing. Moreover, the Operating Administrations pay for the services provided by the central Transportation Computer Center (TCC). Consequently, if TCC does not stay abreast of current technology, hardware, software, telecommunication capabilities and security features, they are providing a disservice to their customers, fees for service are out of line with competitors, and overall DOT performance suffers. To address these major concerns, funding for the following initiatives is requested.

Mandatory Increases - $-114,000

The net of non-recurring costs, such as one-time equipment purchases and one-time contract services and nondiscretionary increases for annualization of FY 1990 pay raise; 50 percent funding (the remainder is absorbed) of the FY 1991 pay raises; funding for normal within-grade and merit pay increases; price increases for supplies; and Headquarters Space Rental.

New or Expanded Programs and Services

Administrative System Improvement Program (ASIP) - $600,000 1 FTE

Like most Federal agencies, the Department of Transportation is operating financial management and subsidiary systems which are not integrated. These systems have been independently developed without benefit of an overall system strategy or consideration for sharing data in a uniform, efficient manner. Development efforts to date have not addressed data standardization or the notion of developing administrative systems based on the corporate information needs of the Department. Instead systems have been developed with a much more limited informational perspective. This fragmented approach has resulted in systems which either cannot share common data, or do so in an inefficient manner; have limited capabilities to provide senior managers with administration/department level management information; are difficult and expensive to modify; are redundant of other systems; or inconsistently apply internal controls. Further, because of this approach, myriad hardware and database configurations must be supported with scarce Departmental resources. An effective practice used by industry today is to build systems according to the corporate information needs of the organization as a whole rather than individual organizational components.

The ASIP is a Departmental, "umbrella" program designed to replace existing, non-standard financial management and subsidiary systems with integrated, Department-wide systems. An objective of the program is to undertake these improvement initiatives based upon the results of a strategic planning process.

The core of ASIP is the Departmental Accounting and Financial Information System (DAFIS). DAFIS development and implementation is well underway and will provide the Department with a single accounting system. Future development efforts addressing other administrative systems will be initiated under ASIP. Prior to initiating new projects in the future, ASIP will develop a strategic plan based upon Departmental information needs.

Funding of $600,000 and one FTE are required in FY 1991 to complete data standardization efforts, cross reference DOT administrative data elements, and initiate the construction of a DOT administrative data model. Implementation of ASIP will result in less costly development, maintenance, and operation of administrative systems; more timely and consistent information at all reporting levels; availability of executive level management information; improved efficiency through single-source data capture and integrated sharing of standardized data; and compliance with OMB Circular A-127 directives.

Uniform Procurement Management System (UPMS) - $1,741,000 2 FTEs

DOT maintains numerous procurement systems that vary in capability, automation, size, and utility. Each of these systems is independent of one another and of other systems requiring procurement-related information (i.e., accounting and financial systems). This condition has been criticized by the DOT Inspector General and is inconsistent with the policy and direction contained in OMB Circular A-127, "Financial Management Systems." DOT conducted the necessary project initiation studies for a UPMS development effort. The studies, which were completed in October 1989, included a feasibility study, cost/benefit study, and risk assessment.

For FY 1991, funding of $1,741,000 and 2 FTEs are needed for planned activities which include designing, programming and testing the initial UPMS modules. Program management functions include development of conversion, implementation and training plans.

Some of the major benefits expected to be achieved with the development and implementation of UPMS include: reduced costs associated with developing, maintaining and upgrading the many independent and nonstandard systems being operated by DOT Operating Administrations; more timely, accurate, and useful procurement information to DOT procurement specialists, DOT financial managers, Central Agencies, such as OMB, GSA and OPM, and other external organizations, such as Congress; and greater system controls and data integrity which meet statutory requirements and increase the opportunity to detect fraud, waste and abuse.

Office Automation - $1,140,000

Past budget constraints have left OST lagging behind the automation capabilities of central government agencies, the transportation industry, and some of the DOT Operating Administrations. This has hampered OST's ability to be responsive and supportive to these groups, as well as to the Congress. The goal of the automation project is to integrate office automation and data processing technology into the day-to-day activities of OST. This project will go well beyond the standard office tools of electronic mail and word processing and will provide for standard system components that will allow the OST to build other applications; e.g., financial systems, procurement systems, personnel systems, etc., on this base. This project, once implemented, will enable the OST to respond to the aforementioned organizations with timely and accurate data, reduce paperwork, and simplify workflow, thereby greatly improving operating efficiency, performance, and productivity. This project is in full concert with the Secretary's initiative to increase DOT's productivity while providing better quality service to the public and the industry.

For FY 1991, an increase of $1,140,000 is requested to fully implement this initiative. This funding provides for installation and implementation, acceptance testing, maintenance support, operation support, and training. A piecemeal approach will be more costly and less effective.

Tape Cartridge System - $300,000

OST has the responsibility for providing reliable, state-of-the-art equipment to support the requirements of the DOT Operating Administrations. Currently, slow speed, poor tape reliability, expensive tape drive maintenance, and tape library growth necessitate newer tape cartridge technology for the TCC. Without new technology, these problems will only become more serious resulting in greater costs and decreased services to the Operating Administrations. For FY 1991, $300,000 is needed to implement this new technology.

Automated Information Systems Security (AISS) Program - $400,000

The objective of the Department's AISS program is to ensure the security and integrity of mission-essential automated information systems and to protect all critical information resources management resources (e.g., data, software, hardware) from accidental or deliberate unauthorized access, modification, disruption or destruction. The central activity of the AISS program is primarily one of coordination and oversight concerning Department-wide compliance with the Privacy Act, the Computer Security Act, the Computer Matching and Privacy Protection Act, applicable OMB Circulars and National Security Directives. To this end, the AISS program develops critically needed Departmental information systems security policy, standards and procedures; represents the Department in oversight bodies and other high-level groups on AISS matters; consults and collaborates with OST and the Operating Administrations on the implementation and administration of their AISS programs; and conducts various collateral activities related to the review of the adequacy of the Departmental AISS program as a whole. In carrying out these responsibilities, the AISS program management staff is actively involved in various information systems security disciplines, including computer security, communications security, information security, physical security, personnel security, emanations security, internal controls, and records management. Funding of $400,000 is necessary to support this program.

Computer Upgrade - $4,623,000 1 FTE

An increase of $4,623,000 and one FTE are requested for additional upgrading of TCC's CPU configuration, which is required to provide the processing capacity needed to meet the FY 1991 and future ADP requirements projected by DOT Operating Administrations. This is the second phase upgrade planned to complement the initial upgrading that was funded and accomplished in FY 1989. Without this upgrade, the TCC will once again be in the position of being unable to accommodate increased needs of its customers or provide acceptable response times. This upgrade will allow TCC to take full advantage of prior enhancements and improvements, such as introduction of the latest technology in direct access storage devices and relational database software. The additional FTE is necessary to provide continuous support and close monitoring of the enhanced Departmental mainframe systems maintained by TCC.

This upgrade not only guarantees that the Department's vast ADP systems are cost efficient and reliable, but also allows for more organized, centralized and proficient use of ADP funds. Without this capability, dollars are wasted on several small incomplete systems and on ADP services procured from outside contracts. This defeats OMB's directives to centralize and streamline Federal Highway project management systems, such as the Urban Mass Transportation Grant System, the Coast Guard military payroll and personnel systems, the property management systems, and other large department systems. In addition, if the WCF/TCC cannot provide computer services essential to the mission of the Operating Administrations, the Operating Administrations will be forced to obtain ADP services from more costly third party vendors.

Transportation Office Network System (TONS) Upgrade - $250,000

Additional funding of $250,000 is necessary in FY 1991 to further upgrade the TONS processor, direct access storage devices, and communication capabilities. This upgrade will take advantage of the enhancements announced by the equipment manufacturer thereby supporting the needs of the user base. Recent upgrades to TONS have generated more user demand. This upgrade will not only provide enhanced services to current users but will allow additional user demand to be satisfied.

Optical Disk Imagery - $500,000

An increase in funding of $500,000 is needed to fully implement the installation of an optical disk document storage and retrieval system for Department-wide application. This system will provide the DOT Operating Administrations with the ability to store and link paper files with computer data in a single system and retrieve and display that information on single or multiple workstations in an almost instantaneous work form. The system's electronic filing capabilities will greatly reduce the amount of time and expense associated with manual retrieval of information and will allow multiple users to concurrently access the same image. It significantly reduces the occurrences of misfiling and loss of data. These processes can be accomplished in a fraction of the space and time previously required for conventional paperwork processing and will result in significant future savings of money and space.

Uninterruptible Power Source (UPS) - $1,540,000

A one-time increase of $1,540,00 is needed for the installation of a UPS in TCC's facility. The UPS will protec. user data and software from the risk of permanent damage and loss that could result from sudden and/or prolonged power outages. Customer usage of the TCC has increased significantly over the past few years and other major programs will be added in the near future. This increased usage clearly warrants the higher level of reliability and integrity which would be provided by the UPS. The investment required to implement this standard safeguard is small when compared to the losses that could result from damage to the substantial amount of ADP equipment in operation in the TCC or to the information contained in these systems.

Executive Information System (EIS) - $1,100,000

The Executive Information System is a computer system designed specifically for the Secretary to access DOT data at a summary level. DOT has many management information systems. These types of systems are utilized by middle management and do not provide information in a form that is meaningful to senior management. The EIS is designed to be used by senior management to focus, filter, and organize the information for the executive to make more efficient use of it. The goals of the EIS are to reduce the amount of data bombarding the executive and to increase the relevance, timeliness, and usability of the information that does reach the executive. The EIS to be designed for the Secretary would be used by his top level staff.

An increase of $1,100,000 is needed for the design and implementation of the system.

Miscellaneous - $1,335,000

Additional funding of $1,335,000 is necessary to support training to keep abreast of constantly changing technology; non-capitalized equipment; minor software upgrades; travel for more representatives from the Administrations to go to Oklahoma City at various stages of their DAFIS implementation (due to the increase in the number of Administrations being implemented in FY 1991); increases due to the expansion of DAFIS operational support; and increased cost for transportation of things due to the shipment of Coast Guard equipment to Washington for use by other Operating Administrations when current DAFIS equipment is replaced by standard Coast Guard workstations.

OVERHEAD - $+86,000

There is no discretionary funding in this area. If the WCF is to make even minor improvements and perform effectively, it must receive small increases to its overhead budget.

Mandatory Increases - $73,000

The net of non-recurring costs and nondiscretionary increases for annualization of FY 1990 pay raise; 50 percent funding (the remainder is absorbed) of the FY 1991 pay raises; funding for normal within-grade and merit pay increases; price increases for supplies; and Headquarters Space Rental.

New or Expanded Programs and Services

Miscellaneous - $13,000

Additional funding of $13,000 is necessary to support increases for non-capitalized equipment and an automated applicant supply information system to track SF-171's.

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

TRUST FUNDS

GIFTS AND BEQUESTS

PROGRAM AND FINANCING (in thousands of dollars)

Identification code 69-8548-0-7-407		1989 Actual	1990 Estimate	1991 Estimate
Program by Activities				
10.00	Total obligations (object class 25.0	—	—	—
Financing:				
21.40	Unobligated balance available, start of year: Treasury balance	-28	-28	-28
24.40	Unobligated balance available, end of year: Treasury balance	28	28	28
39.00	Budget authority	—	—	—
Relation of obligations to outlays:				
71.00	Obligations incurred, net	—	—	—
72.41	Obligated balance, start of year: U.S. securities: Par value	1	1	1
74.41	Obligated balance, end of year: U.S. securities: Par value	- 1	- 1	- 1
90.00	Outlays	—	—	—

Donations received are available for transportation activities

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

ACTIVITIES TRANSFERRED FROM SALARIES AND EXPENSES
INTERSTATE COMMERCE COMMISSION

(Proposed for later transmittal, proposed legislation)

PROGRAM AND FINANCING (in thousands of dollars)

Identification Code 69-0110-2-1-401	1989 Actual	1990 Estimate	1991 Estimate
Program by activities:			
10.00 Total obligations.................	—	—	16,075
Financing:			
40.00 Budget authority (appropriation)..	—	—	16,075
Relation of obligations to outlays:			
71.00 Obligations incurred, net.........	—	—	16,075
74.40 Obligated balance, end of year..	—	—	- 1,605
90.00 Outlays..........................	—	—	14,470

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

ACTIVITIES TRANSFERRED FROM SALARIES AND EXPENSES, INTERSTATE COMMERCE COMMISSION

PROGRAM AND PERFORMANCE

Legislation has been proposed to sunset the Interstate Commerce Commission at the end of 1990 and transfer residual rail functions to the Department of Transportation. Rail antitrust functions will be administered by the Department of Justice, and handling of consumer complaints regarding household goods movers would transfer to the Federal Trade Commission.

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

ACTIVITIES TRANSFERRED FROM SALARIES AND EXPENSES
INTERSTATE COMMERCE COMMISSION

OBJECT CLASSIFICATION (in thousands of dollars)

Identification Code 69-0110-2-1-401	1989 Actual	1990 Estimate	1991 Estimate
Personnel compensation:			
11.1 Full-time permanent	—	—	10,480
11.3 Other than full-time permanent	—	—	170
11.5 Other personnel compensation	—	—	150
11.9 Total personnel compensation	—	—	10,801
12.1 Personnel benefits: Civilian	—	—	1,611
13.0 Benefits to former personnel	—	—	417
21.0 Travel and transportation of persons	—	—	462
23.1 Rental payments to GSA	—	—	1,313
23.3 Communications, utilities, and miscellaneous charges	—	—	498
24.0 Printing and reproduction	—	—	154
25.0 Other services	—	—	571
26.0 Supplies and materials	—	—	118
31.0 Equipment	—	—	130
99.9 Total obligations	—	—	16,075

PERSONNEL SUMMARY

Total number of full-time permanent positions	—	—	224
Total compensable workyears: Full-time equivalent employment	—	—	224

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

[COMMISSION ON AVIATION SECURITY AND TERRORISM]

[For necessary expenses for the operation and expenses of the Commission on Aviation Security and Terrorism, to remain available until expended, $1,000,000, to implement the Executive Order 12686 of August 4, 1989.] (Department of Transportation and Related Agencies Appropriations Act, 1990.)

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

COMMISSION ON AVIATION SECURITY AND TERRORISM

PROGRAM AND FINANCING (in thousands of dollars)

Identification code 69-1850-0-1-407	1989 Actual	1990 Estimate	1991 Estimate
Program by activities			
10.00 Total obligations..............	—	1,000	—
Financing:			
40.00 Budget authority (appropriation)	—	1,000	—
Relation of obligations to outlays:			
71.00 Obligations incurred, net......	—	1,000	—
90.00 Outlays........................	—	1,000	—

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

COMMISSION ON AVIATION SECURITY AND TERRORISM

PROGRAM AND PERFORMANCE

The Commission on Aviation Security and Terrorism will review and evaluate policy options in connection with aviation security with particular reference to the destruction on December 21, 1988, of Pan American World Airways Flight 103. The Commission is scheduled to terminate in 1990.

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

COMMISSION ON AVIATION SECURITY AND TERRORISM

OBJECT CLASSIFICATION (in thousands of dollars)

Identification Code 69-1850-0-1-407		1989 Actual	1990 Estimate	1991 Estimate
	Personnel compensation:			
11.3	Other than full-time permanent	—	129	—
11.5	Other personnel compensation	—	1	—
11.9	Total personnel compensation	—	130	—
12.1	Personnel benefits: Civilian	—	15	—
21.0	Travel and transportation of persons	—	115	—
23.1	Rental payments to GSA	—	72	—
23.3	Communications, utilities, and miscellaneous charges	—	33	—
24.0	Printing and reproduction	—	50	—
25.0	Other services	—	485	—
26.0	Supplies and materials	—	6	—
31.0	Equipment	—	94	—
99.9	Total obligations	—	1,000	—

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DEPARTMENT OF TRANSPORTATION
GSA RENTAL PAYMENTS
(excludes reimbursements)

MODE/ACCOUNT		FY 1989 Actual		FY 1990 Estimated		FY 1991 Estimated	
		$(000)	SQ. FT. (000)	$(000)	SQ. FT. (000)	$(000)	SQ. FT. (000)
FHWA	Limitation on Gen. Oper. Exp.	11,501	857	13,739	866	14,234	866
	Motor Carrier Safety	2		288	25	295	25
	Subtotal, FHWA	11,503	857	14,027	891	14,529	891
NHTSA	Operations and Research (GF)	2,268	99	2,759	99	2,870	99
	Operations and Research (TF)	1,046	46	1,194	46	1,234	46
	Hiway Traf. Sfty. Gr.(Trns. to O&R)	175	8	175	8	175	8
	Subtotal, NHTSA	3,489	153	4,128	153	4,279	153
FRA	Office of the Administrator	1,181	70	1,415	70	1,415	70
	Railroad Safety *	1,176	64	1,278	68	1,440	70
	Railroad Research and Devel. *	76	4	82	4	87	4
	Subtotal, FRA	2,433	138	2,775	142	2,942	144
UMTA	Administrative Expenses	2,447	111	2,986	110	3,062	110
FAA	Operations *	29,939	2,467	38,011	2,717	45,406	3,133
USCG	Operating Expenses	23,019	1,707	28,746	1,768	31,353	1,856
	Reserve Training	630	150	650	150	680	150
	Research, Devel., Test, & Eval.	444	80	460	80	518	80
	Subtotal, USCG	24,093	1,937	29,856	1,998	32,551	2,086
SLSDC	Operations and Maintenance *	132	6	157	6	163	6
OIG	Salaries and Expenses	1,675	91	2,000	97	2,112	97
RSPA	Research and Special Programs	799	39	1,079	39	1,214	39
	Pipeline Safety	296	15	419	15	433	15
	Subtotal, RSPA	1,095	54	1,498	54	1,647	54
OST	Salaries and Expenses	5,172	232	6,065	188	6,352	188
	Working Capital Fund	5,157	243	6,093	256	6,337	256
	Commission on Av. Sec. & Terrorism	—	—	72	4	—	—
	Subtotal, OST	10,329	475	12,230	448	12,689	444
	TOTAL, DOT (Excl. MARAD)	87,135	6,309	107,668	6,615	119,380	7,118

* Corrects amounts as shown in President's Budget

U.S. Department of
Transportation

BUDGET ESTIMATES

FISCAL YEAR 1991

URBAN MASS TRANSPORTATION ADMINISTRATION

SUBMITTED FOR USE OF
THE COMMITTEES ON APPROPRIATIONS

DEPARTMENT OF TRANSPORTATION

URBAN MASS TRANSPORTATION ADMINISTRATION

FISCAL YEAR 1991
BUDGET ESTIMATES

SUBMISSION TO CONGRESS

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

FY 1991 BUDGET SUBMISSION TO CONGRESS

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DEPARTMENT OF TRANSPORTATION

URBAN MASS TRANSPORTATION ADMINISTRATION

INTRODUCTION

In FY 1991, combined appropriations and obligation limitations totaling $1.16 billion in general funds and $1.14 billion in trust funds are requested for the various programs administered by the Urban Mass Transportation Administration (UMTA). Thus, our total request for new general and trust funds combined is $2.3 billion. The President's transit budget for FY 1991 represents a substantial increase from previous proposals on the Federal commitment to the Nation's mass transportation systems. In addition, this proposal is, for the most part, consistent with the framework of the existing authorization, which is due to expire at the end of 1991. The underlying principle in the development of the FY 1991 budget is predicated on the need to focus Federal transit assistance on maintaining the capital infrastructure of local public transportation, rather than on providing operating subsidies to the Nation's 30 largest cities.

The FY 1991 budget, within the constraints imposed by the Federal deficit, targets Federal transit assistance to maintaining capital infrastructure. The capital funds in the FY 1991 budget proposal, together with State and local financing, are sufficient to maintain the existing infrastructure. UMTA formula and discretionary capital grants in FY 1991 are proposed to be essentially the same level as FY 1990. The largest cost of maintaining the transit infrastructure is the cost of restoring existing rail facilities and equipment. This is particularly true in older rail cities like New York, Chicago, Philadelphia, northeast New Jersey, Boston, San Francisco, Pittsburgh, and Cleveland. Increased attention to capital infrastructure entails expanding State, local and private sector financing of major new capital projects by means of market and other financing tools.

Reductions from the 1990 level result primarily from our proposal to eliminate Federal operating subsidies to the 30 largest urbanized areas, with populations in excess of one million persons. In FY 1990, operating subsidies total $508 million for these 30 large cities, accounting for less than six percent of their total operating costs. State and local financing in these largest metropolitan areas can readily offset this proposed Federal reduction. Furthermore, Federal operating assistance is more effectively utilized by smaller areas. Average operating costs per vehicle hour in the largest cities are 60 percent higher than the average for the smallest cities, indicating that smaller urbanized areas are more efficient in controlling their operating costs. The Federal government should not be required to subsidize those activities whose costs are largely determined by the local decision-making process. Therefore, while Federal assistance is eliminated for the largest urbanized areas, urbanized areas with populations under one million persons would not have their operating assistance caps reduced below the current FY 1990 level.

Since 1991 is the last year under the existing authorization, a second major policy initiative embodied in this budget is the proposal to limit Federal spending on New Starts in FY 1991 to those four projects for which the Government has signed, or will soon sign, full funding contracts: 1) St. Louis Metrolink, $72 million; 2) Denver Busway project, $18 million; 3) Miami, Florida Downtown People Mover extensions, $23 million; and 4) the Los Angeles Metrorail project, $285 million. The level of funding proposed for the Discretionary Grants programs in FY 1991 is slightly above the FY 1990 level and equal to that of FY 1989.

UMTA's FY 1991 Budget Highlights are as follows:

o It is requested that UMTA's FY 1990 basic transit capital and operating assistance program, the Formula Grants program, be funded at $1.077 billion. Of the this amount, $1.007 billion would be for Urban Formula Grants (Section 9). In addition,$70 million in Section 9B trust fund formula is also allocated to all urbanized areas and States using the regular Section 9 apportionment factors. Therefore, the combined total to be distributed by formula to urban areas is $1.077 billion.

-- Within the $1.077 billion, cities and areas with populations under one million persons will still be able to obligate operating assistance grants up to their FY 1990 allocation level, which totals $298 million.

-- Nonurban areas (under 50,000 in population) will receive $65 million in Section 18 funding, or about 6 percent, of all formula funds in FY 1991, relative to the 3 percent they are currently authorized to receive under the existing authorization. The additional funding has been added in recognition of the fact that rural areas depend more heavily on Federal assistance and generally have fewer funding alternatives than urban areas. Nonurban areas will continue to be able to obligate, at the discretion of the Governor, any amount of their formula funds for operating assistance. Formula funding also includes $5 million for the Rural Transportation Assistance Program (RTAP).

o An obligation limitation of $1.14 billion is requested for the Discretionary Grants program for which funding is derived from the Mass Transit Account of the Highway Trust Fund. Within this limitation, $394 million will be allocated to infrastructure capital maintenance program for the old rail cities, $398 million will fund four new start projects currently under, or soon to be under, contract, $193 million will be targeted to bus purchase and bus garage related capital investments, and the remaining $155 million will fund planning grants, elderly and handicapped grants, formula blend grants and University Transportation Centers.

Discretionary Grants funding will be distributed as follows:

(in millions of dollars)

Section 3 Capital		$985
Rail Modernization	($394)	
New Starts	($398)	
Bus	($193)	
Section 9B Formula Capital Blend		70
Section 8 Planning		45
Section 16(b)(2) Elderly & Handicapped		35
University Transportation Centers		5
Discretionary Grants total		$1,140

-- It is proposed that much of the $193 million in Section 3 bus funding be used to assist transit authorities to pay the incremental costs of the President's initiative to improve air quality with alternate fuels, and to increase mass transit accessibility for disabled travelers. Under the provisions of the President's Clean Air Act proposals, urban buses in cities with populations over one million will be required to be powered by alternate fuels, with technology new to the transit industry that will involve modifications of bus engines, bus fuel storage facilities, and bus maintenance facilities. Under the Americans with Disabilities Bill, supported by the President, all new transit buses will be accessible (e.g. lifts).

o An appropriation totalling $38 million is requested for Washington Metro (WMATA) under the Stark-Harris legislation to continue financing the capital cost of this system. This $38 million will fund start-up, consultant, and project management costs associated with the construction of the 89.5 mile system. This is the level of Federal assistance agreed to in our 1986 full funding agreement with WMATA. No additional Federal assistance is necessary in FY 1991. A new separate authorization for additional Federal funding of the WMATA system cannot be justified. The Department proposes to address additional investments for the WMATA system in the deliberations of the 1992 highway-transit authorization.

- No separate UMTA appropriation is requested for the Interstate Transfer Grants - Transit program. Effective in FY 1991, transit substitute projects are proposed to be eligible for funding under the Federal-Aid Highways obligation limitation (Trust Fund) administered by FHWA. The transfer of this transit funding to the Highway Trust Fund will save about $0.5 billion in general fund budget authority over the next three to four years.

- In FY 1991, $10 million is proposed for the Research, Training, and Human Resources program. This is the same funding level as in FY 1989 and FY 1990. One initiative being funded through this account is the dissemination of information to the transit industry in support of the alternate fuel requirements for the President's Clean Air legislative initiative.

- Administrative Expenses will be funded at a level of $35.402 million from general fund resources. Of this amount, about 70 percent of the account is required for salaries and another 20 percent is required for the Office of the Secretary's Working Capital Fund, with the remaining ten percent for supplies, equipment, other contracts, travel, training, and other expenses. Our FY 1991 request is for 425 full-time equivalent workyears (FTE) and 410 full-time permanent positions. This staffing request represents a ten FTE increase over FY 1990 (415 FTE), but is six FTE below the FY 1989 ceiling (431 FTE). Additional staff is needed to strengthen project management oversight. UMTA is not requesting funds for consulting services in FY 1991.

The attached tables summarize the UMTA budget and program levels for FY 1989, FY 1990 and FY 1991.

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
RESOURCE SUMMARY
($ in Thousands)

APPROPRIATION TITLE	BUDGET AUTHORITY FY 1989 ACTUAL	FY 1990 ESTIMATE	FY 1991 REQUEST
Administrative Expenses	31,882	31,809	35,402
Research, Training and Human Resources	10,000	9,970	10,000
Interstate Transfer Grants--Transit	200,000	159,520	0
Washington Metro	168,000	84,745	38,000
Formula Grants	1,605,000	1,625,110	1,076,800
Urban Capital Grants	(728,904)	(752,312)	(709,000)
Urban Operating Assistance Grants	(804,692)	(802,278)	(297,800)
Nonurban Formula Grants	(66,404)	(65,535)	(65,000)
RTAP	(5,000)	(4,985)	(5,000)
Miscellaneous Accounts	0	0	0
Discretionary Grants (Trust Fund)	1,250,000	1,281,800	1,400,000
TOTAL BUDGET AUTHORITY	3,264,882	3,192,954	2,560,202
(General Fund)	(2,014,882)	(1,911,154)	(1,160,202)
(Trust Fund)	(1,250,000)	(1,281,800)	(1,400,000)
LIQUIDATING CASH APPROPRIATION	400,000	897,300	815,000

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
RESOURCE SUMMARY
($ in Thousands)

APPROPRIATION TITLE	PROGRAM LEVEL FY 1989 ACTUAL	FY 1990 ESTIMATE	FY 1991 REQUEST
Administrative Expenses	31,741	31,809	35,402
Research, Training and Human Resources	11,350	14,021	10,000
Interstate Transfer Grants--Transit	237,174	174,257	0
Washington Metro	186,158	127,929	38,000
Formula Grants	1,729,054	1,800,000	1,363,080
Urban Formula Grants	(1,645,591)	(1,715,692)	(1,293,080)
Nonurban Formula Grants	(78,804)	(78,111)	(65,000)
RTAP	(4,659)	(6,197)	(5,000)
Miscellaneous Accounts	1,006	1	0
Discretionary Grants (Trust Fund)	1,339,161	1,790,178	1,140,000
Discretionary Grants	(1,267,841)	(1,699,597)	(1,070,000)
Urban Formula Grants	(71,320)	(90,581)	(70,000)
TOTAL BUDGET AUTHORITY	3,535,644	3,938,195	2,586,482
(General Fund)	(2,196,483)	(2,148,017)	(1,446,482)
(Trust Fund)	(1,339,161)	(1,790,178)	(1,140,000)

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
RESOURCE SUMMARY
($ in Thousands)

	OUTLAYS		
APPROPRIATION TITLE	FY 1989 ACTUAL	FY 1990 ESTIMATE	FY 1991 REQUEST
Administrative Expenses	33,625	31,502	35,043
Research, Training and Human Resources	18,948	19,155	19,434
Interstate Transfer Grants--Transit	189,050	205,038	177,800
Washington Metro	207,637	206,200	183,740
Formula Grants	2,108,478	1,929,939	1,720,233
Urban Formula Grants	(2,104,083)	(1,923,671)	(1,689,550)
Nonurban Formula Grants	(4,320)	(3,277)	(26,187)
RTAP	(75)	(2,991)	(4,496)
Miscellaneous Accounts	135,219	130,000	121,467
Discretionary Grants (Trust Fund)	848,508	976,387	1,095,387
Discretionary Grants	(847,921)	(972,897)	(1,077,929)
Urban Formula Grants	(587)	(3,490)	(17,458)
TOTAL BUDGET AUTHORITY	3,541,465	3,498,221	3,353,104
(General Fund)	(2,692,957)	(2,521,834)	(2,257,717)
(Trust Fund)	(848,508)	(976,387)	(1,095,387)

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
RESOURCE SUMMARY

	FTE WORK YEARS		
Administrative Expenses	FY 1989 Actual	FY 1990 Estimate	FY 1991 Request
Full-time equivalent employment subject to ceiling:			
Full-time	410	405	413
Other-than-full-time permanent	11	10	12
Total FTE Work Years	421	415	425
Full-time equivalent employment non-ceiling:			
Other	11	12	12
Total FTE (Ceiling and Non-ceiling)	432	427	437

TITLE III--GENERAL PROVISIONS

Sec. 310. (f) Notwithstanding any other provision of law, funds available under 23 U.S.C. 103(e)(4) for highway interstate substitute projects shall also be available for mass transit interstate substitute projects.

[Sec. 313. None of the funds in this or any other Act shall be made available for the proposed Woodward light rail line in the Detroit, Michigan, area until a source of operating funds has been approved in accordance with Michigan law: Provided, That this limitation shall not apply to alternatives analysis studies under Section 21(a)(2) of the Urban Mass Transportation Act of 1964, as amended.]

Sec. [314] 312. The limitation on obligations for the Discretionary Grants program of the Urban Mass Transportation Administration shall not apply to any authority under Section 21(a)(2) of the Urban Mass Transportation Act of 1964, as amended, previously made available for obligation.

Sec. [315] 313. Notwithstanding any other provision of law, none of the funds in this Act shall be available for the construction of, or any other costs related to, the Central Automated Transit System (Downtown People Mover) in Detroit, Michigan.

[Sec. 317. Every 30 days, the Urban Mass Transportation Administration shall publish in the Federal Register an announcement of each grant obligated pursuant to Sections 3 and 9 of the Urban Mass Transportation Act of 1964, as amended, including the grant number, the grant amount, and the transit property receiving each grant.]

[Sec. 319. Notwithstanding any other provision of law, funds appropriated in this or any other Act intended for studies, reports, or research, and related costs thereof including necessary capital expenses, are available for such purposes to be conducted through contracts or financial assistance agreements with the educational institutions that are specified in such Acts or in any report accompanying such Acts.]

[Sec. 334. (b) UMTA COMMUTER RAIL SERVICE.--Section 337 of Public Law 100-457 is amended to read as follows:

Notwithstanding any other provision of law, when a commuter rail service has been suspended for safety reasons, and when a statewide or regional agency or instrumentality commits to restoring such service by the end of 1989, and when the improvements needed to restore such service are funded without Urban Mass Transportation Administration funding, the directional route miles of such service shall be included in the 1988 Section 15 Report as well as subsequent years. If such service is not restored by the end of 1989, the money received as a result of the inclusion of the directional route miles shall be returned to the disbursing agency, the Urban Mass Transportation Administration.

(c) STATEWIDE OPERATING ASSISTANCE.--Section 9(2)(A).--In any case in which a statewide agency or instrumentality is responsible under State laws for the financing, construction and operation, directly by lease, contract or otherwise, of public transportation services, and when such statewide agency or instrumentality is the designated recipient of UMTA funds, and when the statewide agency or instrumentality provides service among two or more urbanized areas, the statewide agency or instrumentality shall be allowed to apply for operating assistance up to the combined total permissible amount of all urbanized areas in which it provides service, regardless of whether the amount for any particular urbanized area is exceeded. In doing so, UMTA shall not reduce the amount of operating assistance allowed for any other State, or local transit agency or instrumentality within the urbanized areas affected. This provision shall take effect with the fiscal year 1990 Section 9 apportionment.]

[Sec. 339. The Secretary shall conduct a thorough independent safety review of the New York Metropolitan Transportation Authority, including the New York City Transit Authority, the Long Island Railroad and Metro-North commuter railroads, using available funds or funds withheld from formula money allocated to the New York portion of the New York-Northeast New Jersey urbanized area. The Secretary shall submit a comprehensive plan, within thirty days after the date of enactment of this Act, for conducting such an investigation, including the cost and scope of the investigation and an expeditious schedule for completion of such an investigation.]

[Sec. 340. The Urban Mass Transportation Act of 1964, as amended (49 U.S.C. 1609 et seq.), is amended by adding at the end of section 23 the following new subsection:

"(h) SAFETY, FINANCIAL AND PROCUREMENT COMPLIANCE REVIEWS.--In addition to the purposes provided for under subsection (a), the funds made available under subsections (a) (1) through (5) may be used by the Secretary to contract with any person to provide safety, procurement, management and financial compliance reviews, and audits of any recipient of funds under any such subsection. Any contract entered into under this subsection shall not be subject to the requirements of subsection (d), (e), (f), or (g)".]

APPROPRIATION LANGUAGE

Administrative Expenses

For necessary administrative expenses of the urban mass transportation program authorized by the Urban Mass Transportation Act of 1964, as amended (49 U.S.C. 1601 et seq.), and 23 U.S.C. chapter 1, in connection with these activities, including hire of passenger motor vehicles and services as authorized by 5 U.S.C. 3109, [$31,809,000: Provided, That none of the funds provided in this Act shall be used to implement or enforce the April 25, 1989, Notice of Proposed Rulemaking, "Major Capital Investment Projects"] $35,402,000. (Department of Transportation and Related Agencies Appropriations Act, 1990.)

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
ADMINISTRATIVE EXPENSES
Program and Financing (in thousands of dollars)

Identification code 69-1120-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
10.00 Total obligations...........	31,741	31,809	35,402
Financing:			
25.00 Unobligated balance lapsing......	141	...	...
40.00 Budget authority (Appropriation)............	31,882	31,809	35,402
Relation of obligations to outlays:			
71.00 Obligations incurred, net........	31,741	31,809	35,402
72.40 Obligated balance, start of year.	4,671	2,874	3,181
74.40 Obligated balance, end of year...	-2,874	-3,181	-3,540
77.00 Adjustments in expired accounts..	87	...	...
90.00 Outlays.....................	33,625	31,502	35,043
(Memo cast: 21.8)	(Memo cast: 8)	(Memo cast: 8)	(Memo cast: 4.8)

GPO : 1971 O - 442-317

PROGRAM AND PERFORMANCE STATEMENT

ADMINISTRATIVE EXPENSES

This appropriation finances, with general revenues from the Treasury, personnel and other support costs associated with managing and directing UMTA program responsibilities including executive direction, policy, budget, financial management, civil rights, public affairs, legal, grants delivery and management, technical assistance, and research and demonstration support. In 1991, funds are requested to strengthen project management oversight by increasing staff levels in the field offices.

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
ADMINISTRATIVE EXPENSES
OBJECT CLASSIFICATION
(in thousands of dollars)

Identification code 69-1120-0-1-401		1989 actual	1990 estimate	1991 estimate
	Personnel compensation:			
11.1	Full-time permanent...........	18,374	19,134	20,791
11.3	Other than full-time permanent	470	548	575
11.5	Other personnel compensation..	506	351	382
11.9	Total personnel compensation	19,350	20,083	21,748
12.1	Civilian personnel benefits.....	2,609	2,770	3,076
13.0	Benefits for former personnel...	30	30	30
21.0	Travel and transportation of persons....................	649	498	692
22.0	Transportation of things........	36	30	31
23.1	Rental payments to GSA..........	2,447	2,986	3,062
23.2	Rental payments to others.......	100	104	106
23.3	Communications, utilities, and miscellaneous charges........	923	942	1,012
24.0	Printing and reproduction.......	261	285	333
25.0	Other services..................	4,438	3,977	4,811
26.0	Supplies and materials..........	189	83	169
31.0	Equipment.......................	707	20	331
43.0	Interest and dividends..........	2	1	1
99.9	Total obligations...........	31,741	31,809	35,402

(Memo [illegible]: 28.5) (Memo [illegible]: 8) (Memo [illegible]: 8) (Memo [illegible]: 4.9)

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
ADMINISTRATIVE EXPENSES
PERSONNEL SUMMARY

Identification code 69-1120-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Total number of full-time permanent positions	425	400	410
Total compensable workyears:			
Full-time equivalent employment	432	427	437
Full-time equivalent of overtime and holiday hours	2	2	2

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

ADMINISTRATIVE EXPENSES

Comparative Summary of Activity
(Dollars in Thousands)

	FY 1989 Actual	FY 1990 Actual	FY 1991 Request
Appropriation	$31,882	$31,809	**$35,402**

Objectives

The Administrative Expenses appropriation funds the personnel and other support costs to execute and manage the UMTA program. Administrative Expenses were funded from general revenues in FY 1989 and FY 1990 and are proposed to continue to be so funded in FY 1991.

Resources are requested to accomplish the following:

- timely and efficient delivery of both formula and discretionary funds;
- oversight and necessary actions to make and administer all active grants;
- expansion of the program management function to include procurement and financial oversight;
- development and implementation of the research, training, and human resources programs;
- implementation of new and improved transportation programs; and
- acquisition, development, housing, and support for the staff necessary to accomplish the numerous and various program activities.

Staffing and Program Management

The personnel and other resources requested in this budget perform grant oriented support functions such as preparation, delivery and post award management of UMTA grants, triennial reviews of recipients of UMTA formula grants, execution and management of Section 15 activities which form the basis for formula distribution of UMTA funds, development and implementation of the research, training and human resources program and the administrative and support functions of the agency.

This budget proposes a level of 425 Full-Time Equivalent (FTE) workyears for FY 1991, an increase of ten FTEs from the FY 1990 level. The requested appropriation level of $35.4 million is the minimum needed to support ongoing estimates and improve oversight of UMTA's grantees and programs. It consists of $24.8 million (70.1 percent) for personnel salaries and benefits, $7.0 million (19.9 percent) for DOT Working Capital Fund charges, and $3.5 million (10 percent) for the remaining support and administrative costs of the UMTA functions. In FY 1990, UMTA will fully absorb $1,082 thousand in unfunded increases within an appropriation that is less than FY 1989. $593 thousand represents the 3.6 percent January General Schedule and Senior Executive Service pay raise and the remaining $489 thousand is for mandatory RENT and DOT Working Capital Fund charges. To absorb these increases, UMTA management has made substantial reductions in travel, printing, training, supplies and equipment during FY 1990. The proposed FY 1991 program is essentially the FY 1989 UMTA program, increased by an additional 10 FTEs and with modest increases for inflation and mandatory adjustments.

Paperwork Activities

UMTA does not anticipate any changes in paperwork during FY 1991. However, UMTA will study ways to modify the semi-annual drug testing program reporting requirement during FY 1991 and beyond, which could result in some reduction of paperwork by UMTA grantees.

Consulting Services

UMTA is not requesting funds for consulting services in FY 1991.

Computer Security

No funds are specifically requested to implement computer systems security measures as defined by OMB Circular A-130.

Funding Request

The following table summarizes the Administrative Expenses budget request by major object class:

Administrative Expenses (Obligations)
Major Object Classes
(Dollars in Thousands)

	FY 1989 Actual	FY 1990 Estimate	FY 1991 Request
Personnel Compensation.........$	19,350	$ 20,083	$ 21,748
Personnel Benefits.............	2,608	2,770	3,076
Benefits for Former Personnel..	30	30	30
Travel of Persons..............	649	498	692
Transportation of Things.......	36	30	31
Rental Payments................			
Rental Payments to GSA.......	2,447	2,986	3,062
(DOT/Working Capital Fund (WCF))	<1,849>	<2,208>	<2,311>
Rental Payments to Others....	100	104	106
Communications, Utilities and Miscellaneous.................	923	942	1,012
(DOT/Working Capital Fund)	<296>	<472>	<474>
Printing and Reproduction......	261	285	333
(DOT/Working Capital Fund)...	<242>	<267>	<316>
Other Services.................	4,439	3,977	4,811
(DOT/Working Capital Fund)...	<2,984>	<3,012>	<3,936>
Supplies and Materials.........	189	83	169
Equipment......................	707	20	331
Interest and Dividends.........	2	1	1
Total....................$	31,741	$ 31,809	$ 35,402
(Total DOT/WCF Charges) $	< 5,371>	$< 5,959>	$< 7,037>

Analysis of Changes

An analysis of mandatory changes, price adjustments and program increases between FY 1990 and FY 1991 is presented in the following table:

Analysis of Changes from FY 1990 to FY 1991
(Dollars in Thousands)

FY 1990 Appropriation		$ 31,809
Mandatories and Price Adjustments		
Annualization of 1990 Pay Raise	+ 243	
Within-grade Increases (Including Benefits)	+ 310	
RENT	+ 78	
DOT Working Capital Fund	+ 975	
FTS	+ 22	
Projected Inflation	+ 59	
Funding for 1991 Pay Raise for 3/4 year	+ 796	
Offsetting Reductions in other Object Classes for Partial Funding of FY 1991 Pay Raise	- 398	
Sub-Total		$+ 2,085
Adjusted Base for FY 1991 reflecting Mandatories and Price Adjustments		$ 33,894
Program Increases/(Decreases)		
Compensation and Benefits	+ 182	
Travel	+ 177	
Mail	+ 29	
Employee Training	+ 106	
Supplies and Materials	+ 86	
Equipment	+ 328	
Ten FTE Increase	+ 600	
Sub-Total		$+ 1,508
FY 1991 Request		$ 35,402

EXPLANATION OF CHANGES AND ADJUSTMENTS:

Mandatories and Price Adjustments

Annualization of FY 1990 Pay Raise $+ 243

UMTA has fully absorbed the costs of the last three merit pay and general schedule pay raises. The impact of this absorption has required offsetting reductions in other accounts such as travel, training and supplies. This increase represents the remaining full year cost of the FY 1990 pay raise.

Within-grade Increases + 310

Within-grade increases (WIGs) are mandatory expenses that must be paid to those employees who have maintained a satisfactory or better performance rating and spent the required time at their current step-in-grade. The part of merit pay increases equivalent to WIGs for employees under the Performance Management and Recognition System is included in this amount, which also includes corresponding benefits increases.

Office Space Rent (RENT) + 78

This reflects a $103 thousand increase of GSA Rental charges for UMTA headquarters offices, funded under the DOT Working Capital Fund, offset by a $27 thousand decrease in GSA field space rental charges and a $2 thousand increase for regional office space funded by a reimbursable agreement to the Research and Special Programs Administration (RSPA).

DOT Working Capital Fund + 975

This amount supports increased charges in the Department of Transportation's Working Capital Fund (WCF) which are assessed to each administration based on WCF service usage. The WCF costs are based on a Departmental financial cost recovery formula of individual elements such as the Transportation Computer Center, and are necessary to support capital acquisition and system replacement costs in printing and computer services.

Federal Telephone System (FTS) + 22

In line with guidance provided by the Department of Transportation's Telecommunications Office, which centrally manages the FTS system for DOT, a 10 percent increase in FTS charges assessed to UMTA is anticipated for FY 1991.

EXPLANATION OF CHANGES AND ADJUSTMENTS:

Mandatories and Price Adjustments (Continued)

Projected Inflation	$+	59

This amount reflects a projected inflation factor of approximately 3.3 percent over FY 1990 to cover anticipated general escalations in operating costs for all non-salary expenses except RENT, FTS and WCF, which are separately identified above.

Funding for FY 1991 Pay Raise for 3/4 Year	+	796

The full-year costs associated with the FY 1991 pay raise for Senior Executive Service, Merit Pay and General Schedule employees of UMTA is estimated at $1,061 thousand. During FY 1991, 75 percent, or $796 thousand will actually be paid out. UMTA cannot absorb this pay increase without a corresponding decrease in support programs.

Offsetting Reductions in Other Object Classes for Partial Funding of the FY 1991 Pay Raise	-	398

In order to absorb 50 percent of the FY 1991 costs of the FY 1991 pay raise, reductions in non-salary and benefits accounts will be made to offset $398 thousand in costs. These reductions will be applied to printing, office machine repair contracts, ADP support services and supplies.

Program Increases

Compensation and Benefits	$+	182

This increase restores funding for three permanent change of station moves eliminated in FY 1990 to accommodate a reduced program level. This restored funding returns the permanent change of station funding to the FY 1989 level.

Travel	+	177

This increase of $177 thousand restores funding to the UMTA travel program for essential program, financial and procurement management oversight, triennial reviews, on-site procurement certification reviews, EEO compliance reviews, and site visits to construction projects.

EXPLANATION OF CHANGES AND ADJUSTMENTS:

Program Increases (Continued):

Travel (Continued):

The FY 1991 travel program will be funded at basically the FY 1989 level plus a modest increase for inflation. This travel program is needed to address the OIG's concerns that UMTA's grantee and project management oversight is inadequate.

Penalty Mail	$+	29

The present projection of penalty mail costs will exceed the FY 1990 estimate by $29 thousand due to increased usage of postal and express mail services and modest rate increases.

Employee Training	+	106

As with several other UMTA accounts, this modest increase restores the training programs to nearly the FY 1989 funded level of $284 thousand after the severe reduction of $179 thousand in FY 1990 to accommodate unfunded increases in RENT and DOT Working Capital Fund changes. This will fund the continuation of the successful Excellence in UMTA Program begun in FY 1989 and continued on a smaller scale in FY 1990.

Supplies and Materials	+	86

This increase restores the supplies and materials account to a level slightly below that funded in FY 1989.

Equipment	+	328

This item funds all UMTA equipment, including office furniture, typewriters, and ADP equipment. The requested increase is associated primarily with three specific categories of items:

EXPLANATION OF CHANGES AND ADJUSTMENTS:

Program Increases (Continued):

Equipment (Continued):

First, the replacement of obsolete and overloaded processors, printers, drives and software is planned in FY 1991. This equipment supports the agency financial system, which will continue to be used with a new financial system being implemented in late FY 1991. UMTA's conversion to this new system, the Departmental Accounting and Financial Information System (DAFIS), is mandated by the Office of the Secretary (OST).

Second, the agency's office automation equipment, the majority of which was purchased in FY 1985, will have been in hard service for six years. In addition to being technologically outdated, the equipment will physically fail at an increasing rate and will need to be replaced.

Finally, the agency's local area network file servers, which are located in each of the 22 UMTA headquarters and regional offices, will also be six years old, suffer similar hardware failure problems and will be technically obsolete at this time. Replacements will be necessary to maintain functional capability of the installed software base.

EXPLANATION OF CHANGES AND ADJUSTMENTS (Continued):

Program Increases (Continued):

Ten FTE Increase	+	600

An increase of ten FTEs is requested for FY 1991, all assigned to our regional offices.

As we enter the '90's, new circumstances require new solutions for transit. In 1978, UMTA provided about $3 billion of the total national expenditure of $7.3 billion on transit (capital and operations). A decade later, UMTA provided $3.4 billion to transit of the total national expenditure of $19 billion. The growth of state and local commitments to UTMA sponsored projects has more than doubled and UMTA's current active grant caseload, which is valued at $30 billion, the highest ever. Thus, the statutory oversight responsibilities for UMTA funded projects have exploded while UMTA staff has decreased by over 100 FTEs. The OIG has expressed concern that current UMTA staffing is not sufficient to provide adequate project oversight. The staffing increase we are proposing is designed to strengthen our oversight and reduce the potential for material weaknesses.

UMTA currently manages active grants totalling $30 billion with over $3 billion in new grants added each year. On average, each of our ten regional offices administer 700 active grants valued at $3 billion. The value of grants managed per person in UMTA field offices is more than twice the value of grants administered by FHWA's field staffing. In order to improve project oversight by the regional staff, an increase of ten FTEs is requested. Of this amount, approximately two FTEs will be utilized for clerical duties such as secretaries and grants control assistants.

EXPLANATION OF CHANGES AND ADJUSTMENTS:

Program Increases (Continued):

Ten FTE Increase (Continued):

The remaining staffing would be used to strengthen the statutorily required triennial reviews, improve project and grantee oversight and to administer the expanded Project Management Oversight program.

All 420 UMTA grantees are reviewed over a three-year cycle. The annual scheduling of the triennial reviews is at the discretion of the regional managers but must carry about one-third of the regional caseload each year. The triennial review schedule must include a mix of major, medium and small transit authorities. The most complex and time consuming reviews are performed at the major transit authorities. The reviews could be kept on schedule, strengthened and standardized if additional staff was made available.

In the past two years, GAO and OIG have been critical of UMTA's project oversight. The OIG specifically cited UMTA's limited administrative resources (both staffing and dollars) as a major reason why UMTA is unable to conduct adequate oversight of its national grant program. Inspector General Melchner testified before the House Appropriations Subcommittee on Transportation that UMTA's program management deficiencies were primarily a result of inadequate staffing.

While UMTA does not agree with every OIG finding and criticism, it does believe that additional staffing is needed in a number of areas to reduce the risk of waste, fraud, and abuse.

The Inspector General also noted that UMTA program management oversight has an engineering, rather than a procurement or financial orientation. Enactment of the 1990 Department of Transportation Appropriations Act expanded the one-half percent takedown of program funds to be used for procurement and financial oversight as well as for the previously authorized project management oversight, thus adding additional program responsibilities.

APPROPRIATION LANGUAGE

Research, Training, and Human Resources

For necessary expenses for research, training, and human resources as authorized by the Urban Mass Transportation Act of 1964, as amended (49 U.S.C. 1601 et seq.), to remain available until expended, $10,000,000: Provided, That there may be credited to this appropriation funds received from States, counties, municipalities, other public authorities, and private sources, for expenses incurred for training. (Department of Transportation and Related Agencies Appropriations Act, 1990).

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
RESEARCH, TRAINING, AND HUMAN RESOURCES
Program and Financing (in thousands of dollars)

Identification code 69-1121-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
10.00 Total obligations	11,350	14,021	10,000
Financing:			
17.00 Recovery of prior year obligations	-3,995	...	...
21.40 Unobligated balance available, start of year	-1,406	-4,051	...
24.40 Unobligated balance available, end of year	4,051	...	...
39.00 Budget authority	10,000	9,970	10,000
Budget authority:			
40.00 Appropriation	10,000	10,000	10,000
40.00 Reduction pursuant to P.L. 101-164	...	-30	...
43.00 Appropriation (adjusted)	10,000	9,970	10,000
Relation of obligations to outlays:			
71.00 Obligations incurred, net	11,350	14,021	10,000
72.40 Obligated balance, start of year	46,054	34,462	29,328
74.40 Obligated balance, end of year	-34,462	-29,328	-19,894
78.00 Adjustments in unexpired accounts	-3,995	...	...
90.00 Outlays	18,948	19,155	19,434
(Memo omit: 21.5)	(Memo omit: 8)	(Memo omit: 8)	(Memo omit: 4.9)

PROGRAM AND PERFORMANCE STATEMENT

RESEARCH, TRAINING AND HUMAN RESOURCES

This appropriation finances, with general revenues from Treasury, the Research, Training and Human Resources program which seeks to strengthen the ability of transit industry operating officials to plan, manage and operate their systems more effectively and safely; to address the professional and managerial personnel needs of the transit industry; and to promote the use of private sector activities in the delivery of mass transit services.

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STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
RESEARCH, TRAINING, AND HUMAN RESOURCES
OBJECT CLASSIFICATION
(in thousands of dollars)

Identification code 69-1121-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
25.0 Other services..................	8,631	10,516	7,500
41.0 Grants, subsidies, and contributions................	2,719	3,505	2,500
99.9 Total obligations...........	11,350	14,021	10,000

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

RESEARCH, TRAINING AND HUMAN RESOURCES

Comparative Summary of Activity
(Dollars in Thousands)

	FY 1989 Actual	FY 1990 Estimate	FY 1991 Request
Appropriation	$10,000	$ 9,970	$10,000
Section 6	7,000	7,777	7,800
Section 10	1,250	399	600
Section 11	750	598	600
Section 20	1,000	1,196	1,000

UMTA's Research, Training and Human Resources program is authorized by Sections 6, 10, 11, 15, 20 and 22 of the Urban Mass Transportation Act of 1964, as amended by the Surface Transportation and Uniform Relocation Assistance Act (STURAA) of 1987.

For FY 1990, the Congress appropriated $9.97 million for the Research, Training and Human Resources activity. Of this $9.970 million, $7.777 million was included for Section 6, $0.399 million was included for Section 10, $0.598 million was included for Section 11 and $1.196 million was included for Section 20. These FY 1990 funding levels include a reduction of 0.3 percent to carry out new drug prevention control programs.

In FY 1991, $10 million is being requested for the Research, Training and Human Resources program. Of the $10 million, $7.8 million will be used to support Section 6 Technical Assistance activities, $0.6 million to support Section 10 Management Training activities, $0.6 million to support the Section 11(a) University Research program and $1.0 million to fund the Section 20 Human Resources program. Limited program funds will be used for direct programmatic support of the Technical Assistance activities covering such costs as publications and equipment. In 1989, Section 15 and 22 activities were funded out of the Section 6 funds. In 1991, Section 15 activities may be funded under the Section 8 Planning program.

Section 6

The objectives of the Section 6 program are to undertake policy research, provide technical assistance, demonstrate innovative ideas, and disseminate information. A major new emphasis area is technical support for the 1991 alternative fuel requirements of the President's Clean Air Bill. Other emphasis areas include: improving transportation management; reducing dependence on Federal funds; encouraging greater competition by transit service providers; expanding use of the private sector to provide and finance services; improving urban, suburban and rural services; assisting providers in improving system safety and security; and encouraging transit suppliers to produce innovative and improved products.

Policy research will continue to address relevant policy sensitive subjects to form a basis to effectively administer the UMTA program. Studies and other data gathering activities undertaken to support policy development, legislative initiatives and UMTA program monitoring and evaluation will be funded. Also review, analysis and outreach activities to the business community will be conducted in support of new policy and program initiatives and national priorities.

The maintenance and operations of the data base for the production of the Section 15 Annual reports and the development of the Section 9 formula apportionments is an ongoing activity. In addition to the reports' production, funding is used to evaluate and improve the Section 15 software, determine ways to improve the quality of the data, and to determine ways to reduce the reporting burden.

The Environment Initiative is a joint capital and technical assistance program covering projects for a wide range of transit applications. This initiative will emphasize alternative fuels for buses utilizing compressed natural gas, propane, methanol and ethanol. Funds will be utilized to develop and evaluate transit projects in support of the President's Clean Air Bill and to address such potential problems as the safe handling and use of alternative fuels. This program provides the means for placing alternative fueled vehicles into the mainstream of transit revenue service operations in all metropolitan areas over one million. Over 60 proposals and 42 formal grant applications for alternative fueled buses have been reviewed and processed. It also offers the opportunity for transit systems to take a pro-active position in America's battle for clean air and energy security.

The Entrepreneurial Services Program will continue to stimulate the development of creative small business ventures that supplement conventional public transit systems and respond to the unmet transportation needs of both inner-city and suburban areas. The program will encourage small and minority business persons to identify promising transportation markets within their communities and to design innovative, self-sustaining services that they can operate themselves. The program also encourages community, civic, and neighborhood groups as well as employers and other members of the business community to develop services to meet their own needs instead of relying upon government to do it for them.

The Congestion and Mobility Initiative will continue to influence the institutional and operating environment to develop successful alternatives and reduce dependence on the single occupant automobile. Assistance will be provided to local and State public entities and non-profit entities to address this nation's growing traffic congestion and mobility problems. The program includes assistance in transportation demand management, transportation systems management and innovative transit services. It also includes outreach activities such as seminars, workshops, and the continuation of the National Center for Suburban Mobility at the George Mason University.

The Rural Assistance Program will continue to provide assistance in the areas of training, technical assistance and information to rural and specialized transportation providers.

The Competitive Services Program will continue to encourage public transit agencies to competitively develop transit services by performing "make or buy" decisions with respect to services divisions and to competitively contract with private providers when that proves to be cost effective. This year UMTA is expanding its competitive contracting activities to include maintenance as well as service provision activities.

The Financial Leveraging Initiative encourages the implementation of local capital development projects that require the cooperation of the local public and private sectors to succeed. Assistance will be provided to encourage and implement activities that include joint financing of transit capital projects that require local and private funding sources. A Business Community Outreach Program will be undertaken to encourage employers, developers and merchants to participate in solving local transit problems. Within this program emphasis will be given to the Rail Car Cost Containment Program which will seek out ways to stabilizing and/or reducing the cost of rail cars.

The Human Resources Initiative is dedicated towards cooperating with transit management and labor to improve performance and increase productivity in the transit workforce. Financial assistance activities will include working with community colleges and vocational school programs in order to upgrade existing training and incentive programs designed to promote productivity through increased worker motivation.

The Safety and Drug Initiative will continue to promote safety and security in transit through cooperative efforts with local, state, and transit industry bodies. Safety training efforts will continue to support the development and conduct of courses and seminars designed to improve the management and technical skills of transit safety professionals. The program will also emphasize activities which address drug and alcohol abuse among transit agency employees.

Sections 10, 11 and 20

The Section 10 program will assist transit operators in providing training for managerial, technical, professional and supervisory personnel in the mass transit industry. Grant awards will be based on comprehensive training plans developed in a cost-effective manner. Emphasis will be placed on encouraging cooperative efforts between transit agencies and transit associations in order to broaden the availability of training to mid-size and smaller agencies.

The Section 11(a) program will provide for a series of research and training grants which will utilize and strengthen the capabilities of the academic community to become sources of ongoing advice and information on transportation programs and projects in their own communities. In addition to the 11(a) University Research program, UMTA is requesting $5 million under the Discretionary Grants program, derived from the Trust Fund, to fund DOT's University Transportation Centers [(Section 11(b)] research program.

The Section 20 program will support the development of national and local human resource projects. The program of projects will continue to have three major emphasis areas: technical assistance to disadvantaged and women-owned business enterprises (DBEs/WBEs); training; and opportunities in transit for minorities and females. Research on civil rights activities may also be funded out of Section 6 funds.

APPROPRIATION LANGUAGE

[Interstate Transfer Grants - Transit]

[For necessary expenses to carry out the provisions of 23 U.S.C. 103(e)(4) related to transit projects, $160,000,000, to remain available until expended.] (Department of Transportation and Related Agencies Appropriations Act, 1990.)

STANDARD FORM 300
July 1964, Bureau of the Budget
Circular No. A-11, Revised.
300-101

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
INTERSTATE TRANSFER GRANTS
Program and Financing (in thousands of dollars)

Identification code 69-1127-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
10.00 Total obligations (Object class 41.0)........	237,174	174,257	...
Financing:			
17.00 Recovery of prior year obligations.....................	-147	...	...
21.40 Unobligated balance available, start of year..................	-51,764	-14,736	...
24.40 Unobligated balance available, end of year.....................	14,736	...	...
39.00 Budget authority...........	200,000	159,520	...
Budget authority:			
40.00 Appropriation....................	200,000	160,000	...
40.00 Reduction pursuant to P.L. 101-164...................	...	-480	...
43.00 Appropriation (adjusted)....	200,000	159,520	...
Relation of obligations to outlays:			
71.00 Obligations incurred, net........	237,174	174,257	...
72.40 Obligated balance, start of year.	590,616	638,593	607,812
74.40 Obligated balance, end of year...	-638,593	-607,812	-430,012
78.00 Adjustments in unexpired accounts	-147	...	...
90.00 Outlays.....................	189,050	205,038	177,800

PROGRAM AND PERFORMANCE STATEMENT

INTERSTATE TRANSFER GRANTS - TRANSIT

Grants under this activity are authorized by the Federal-Aid Highway Act of 1973 as amended (23 U.S.C. 103(e)(4)) whereby States and localities may withdraw previously approved segments of the Interstate System and substitute with transit or other highway capital projects. Through 1990, this appropriation provides funding for substitute transit projects while funding for substitute highway projects is included in the budget of the Federal Highway Administration. Beginning in 1991, no funding is requested under this account. Eligible substitute transit project commitments will be funded through the Interstate substitution program under the Federal-Aid Highways Account (Trust Fund), administered by the Federal Highway Administration.

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

INTERSTATE TRANSFER GRANTS - TRANSIT

Comparative Summary of Activity
(Dollars in Thousands)

	FY 1989 Actual	FY 1990 Estimate	FY 1991 Request
Appropriation	$200,000	$159,520	To FHWA ($150,000) (estimated)

The Interstate Transfer Grants program provides Federal financing to allow States and localities, which withdrew nonessential Interstate segments, to fund substituted public transportation improvements under the provisions of 23 U.S.C. 103(e)(4) as amended by the Surface Transportation and Uniform Relocation Assistance Act (STURAA) of 1987.

For FY 1991, no appropriation is requested for the implementation of transit projects under UMTA's Interstate Transfer Grants - Transit heading. It is proposed that existing entitlements be eligible for funding rail transit extension, new start, rail modernization or bus projects under the Interstate Transfer Grants authorization in the Federal-Aid Highways account along with other highway projects. Beginning in 1991, the Interstate Transfer Grants - Transit program would be subject to the obligation limitation on the Federal-Aid Highways account. In 1991, Interstate Transfer Grants - Transit obligations are estimated to be $150 million.

Both transit as well as highway substitute projects should be funded from the Highway Trust Fund for that is where the withdrawn Interstate Highway segments would have been funded had they not been withdrawn. Continuation of the general funded authorization for Interstate Transfer Grants - Transit means that the general funds of the Treasury are being used to subsidize transportation projects that should be financed from the Highway Trust Fund motor fuel revenues user fees. It is consistent with Departmental policy to fund all transportation projects with user fees to the maximum extent possible. In the FY 1989 Senate version of the Department of Transportation appropriations bill, the Senate adopted a similar approach by funding substitute transit projects from the Mass Transit Account of the Highway Trust Fund.

At the end of FY 1989, the estimated additional funds required to complete the remaining transit substitute projects already under development is $663 million. With the $159.52 million appropriation in FY 1990 for the transit portion of the Interstate Transfer Grants program, less than $504 million would be required to fully construct all remaining transit substitute projects beginning in FY 1991. The resources of the Highway Trust Fund can easily accommodate the funding requirements of these remaining transit projects. For the year 1991, we estimate the distribution of the "cost to complete" for transit projects to be as follows:

New York	45 percent
Baltimore	27 percent
Chicago	5 percent
All others	23 percent

APPROPRIATION LANGUAGE

Washington Metro

For necessary expenses to carry out the provisions of section 14 of Public Law 96-184, [$85,000,000] $38,000,000, to remain available until expended. (Department of Transportation and Related Agencies Appropriations Act, 1990.)

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STANDARD FORM 300
July 1964, Bureau of the Budget
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300-101

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
WASHINGTON METRO
Program and Financing (in thousands of dollars)

Identification code 69-1128-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
10.00 Total obligations (Object class 41.0)........	186,158	127,929	38,000
Financing:			
21.40 Unobligated balance available, start of year..................	-61,342	-43,184	...
24.40 Unobligated balance available, end of year....................	43,184	...	...
39.00 Budget authority...........	168,000	84,745	38,000
Budget authority:			
40.00 Appropriation....................	168,000	85,000	38,000
40.00 Reduction pursuant to P.L. 101-164...................	...	-255	...
43.00 Appropriation (adjusted)....	168,000	84,745	38,000
Relation of obligations to outlays:			
71.00 Obligations incurred, net........	186,158	127,929	38,000
72.40 Obligated balance, start of year.	734,723	713,245	634,974
74.40 Obligated balance, end of year...	-713,245	-634,974	-489,234
90.00 Outlays....................	207,637	206,200	183,740
(Memo cmt: 22.8)	(Memo cmt: 8)	(Memo cmt: 8)	(Memo cmt: 4.8)

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PROGRAM AND PERFORMANCE STATEMENT

WASHINGTON METRO

The National Capital Transportation Amendments of 1979 authorized $1.7 billion in Federal funds to support the construction of the Washington Metrorail system. Through 1990, $1,592 million has been appropriated, leaving a balance of $108 million. An appropriation of $38 million is requested for management, consultants, and start-up costs associated with construction on the 89.5 mile system. The proposed funding level is consistent with the Federal commitment under the 1986 full funding agreement. Through 19[illegible], including this request, the Federal Government will have made available a total of $7.61 billion for the Washington Metrorail system, far more resources than for the construction of any other new mass transit system.

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

WASHINGTON METRO

Comparative Summary of Activity
(Dollars in Thousands)

	FY 1989 Actual	FY 1990 Estimate	FY 1991 Request
Appropriation	$168,000	$ 84,745	$ 38,000

Public Law 96-184 (Stark-Harris legislation) enacted January 3, 1980, authorized a total of $1.7 billion for construction of the Washington Metrorail System starting in FY 1982. It also authorized additional Federal participation in the retirement of bonds issued by WMATA. The Stark-Harris funds were intended to supplement and ultimately supplant funding from the Interstate Transfer Grants - Transit program. As Stark-Harris funds near exhaustion ($108.2 million will remain available after FY 1990), we propose to provide funds consistent with the Federal commitment under the 1986 contract with WMATA for the 89.5-mile system. Any additional WMATA funding requests beyond those funded under contract should be considered in the context of the national mass transit program.

For FY 1991, UMTA is proposing $38 million under the Stark-Harris authorization. The $38 million will provide Federal funds for costs consistent with the Federal commitment under the 1986 full funding agreement. The $38 million in FY 1991 is targeted to fund miscellaneous construction, consultants, project management, and start-up costs for projects currently under construction. This budget request will enable all existing projects to proceed without delay.

This $38 million specifically does not include the $13.5 million in Federal funds for construction claims requested by WMATA earlier this year. The requested $13.5 million for construction claims can be funded from previously appropriated funds that remain available or with any surplus once the 89.5 mile system is completed.

The Department is administering the project according to the following quidelines:

1. Only fund construction for parts of the system which constitute operable segments;

2. Only approve funding requests under a full funding agreement for segments under a full funding agreement for which there are sufficient existing authorized funds available to complete said segments; and,

3. Attempt to have WMATA recapture at least part of the value generated for private businesses by Metrorail construction.

Upon completion of an 89.5-mile system, it is estimated that a total of $10.6 billion of capital will have been invested in the WMATA rail system (Table 1). The Federal Government's portion will be $7.7 billion. This figure includes Stark-Harris funds plus the interest and principal payments on the guaranteed bonds. The Federal commitment on the bonds includes: 1) a $51.7 million annual payment to Washington Metro for the two-thirds Federal share of interest payments on $997 million in bonds that become due beginning in the year 2012, and 2) $665 million for the two-thirds Federal share of principal on those bonds.

A successor authorization bill (H.R. 1463) to the current Stark-Harris authorization has been under consideration by the House District Committee. This continuation of Stark-Harris calls for $2.16 billion in additional Federal funding to complete the currently envisioned 103-mile system. The bill assumes an annual Federal contribution of $200 million, matched by $50 million in local funding.

A new separate authorization for additional Federal funding of the system cannot be justified. The Secretary does not support extending the current Stark-Harris authorization and will recommend that the President exercise the veto option if such legislation is passed. The Department proposes to address any additional investments beyond Stark-Harris for the WMATA rail system in our 1992 reauthorization proposal.

WASHINGTON METRO FUNDING SUMMARY
(as of Jan. 29, 1989)

TABLE 1

			(In millions of dollars)		
			LOCAL	FEDERAL	TOTAL
FUNDS APPROPRIATED					
Direct Appropriations (1/3–2/3's)			$573.5	$1,147.0	$1,720.5
Mid-City Line add-on (100% DC)			3.0	0.0	3.0
Add-ons (100% local)			12.9	0.0	12.9
Elderly and Handicapped Facilities (20%–80%)			13.0	52.0	65.0
Arlington Cemetery Station (100% Federal)			0.0	7.4	7.4
Federal-Aid Urban Systems (10%–90%)			3.2	28.5	31.7
Interstate Transfer Grants – Transit			453.8	2,155.8	2,609.6
Stark-Harris (20%–80%)	(Local)	(Federal)			
FY 1983	60.0	$240.0			
FY 1984	62.5	250.0			
FY 1985	62.5	250.0			
FY 1986	54.0	216.2			
FY 1986 PMO (100% Fed)	0.0	1.1			
FY 1987	50.0	200.1			
FY 1987 PMO (100% Fed)	0.0	1.0			
FY 1988	44.9	179.6			
FY 1988 PMO (100% Fed)	0.0	0.9			
FY 1989	41.8	167.2			
FY 1989 PMO (100% Fed)	0.0	0.8			
FY 1990	21.1	84.3			
FY 1990 PMO (100% Fed)	0.0	0.4			
FY 1990 DRUG assessm't	0.0	0.3			
Subtotal, Stark-Harris			396.8	1,591.8	1,988.6
Matching Bond Sales			48.5	0.0	48.5
SUBTOTAL – FUNDS APPROPRIATED TO DATE (FY89)			1,504.7	4,982.5	6,487.2
BOND OBLIGATIONS (FY 1979 – 2014)					
Interest Payments on Bonds (1/3–2/3)			982.7	1,965.4	2,948.1
Principal Payments on Bonds (1/3–2/3)			332.4	664.7	997.1
SUBTOTAL – BOND OBLIGATIONS			1,315.1	2,630.1	3,945.2
REMAINING STARK-HARRIS AUTHORIZATION					
Available for future appropriations			26.9	108.2	135.1
Construction/Start-up/Mgmt.			(26.9)	(107.7)	(134.6)
PMO			(0.0)	(0.5)	(0.5)
TOTAL COST FOR 89.5 MILE SYSTEM			2,846.7	7,720.8	10,567.5
ADDITIONAL FUNDS (H.R. 1463) NEEDED TO COMPLETE 103 MILE SYSTEM (25%–75%)			540.0	2,160.0	2,700.0
GRAND TOTAL			$3,386.7	$9,880.8	$13,267.5

APPROPRIATION LANGUAGE

Formula Grants

For necessary expenses to carry out the provisions of sections 9 and 18 of the Urban Mass Transportation Act of 1964, as amended (49 U.S.C. 1601 et seq.), [$1,625,000,000] $1,071,800,000, together with $5,000,000 to carry out the provisions of section 18(h) of the Urban Mass Transportation Act of 1964, as amended, to remain available until expended: Provided, That notwithstanding any other provision of law, of the funds provided under this head for formula grants, no more than [$804,691,892] $297,800,000 may be used for operating assistance under section 9(k)(2) of the Urban Mass Transportation Act of 1964, as amended: Provided further, That operating assistance shall be limited to cities and areas with populations of one million persons or less: Provided further, That notwithstanding any other provision of law, before apportionment of this funds, [$16,554,033] $32,497,435 shall be made available for the purposes of section 18 of the Urban Mass Transportation Act of 1964, as amended.] (Department of Transportation and Related Agencies Appropriations Act, 1990.)

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STANDARD FORM 300
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DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
FORMULA GRANTS
Program and Financing (in thousands of dollars)

Identification code 69-1129-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
00.01 Urban Formula Grants.............	1,645,591	1,715,692	1,293,080
00.02 Nonurban Formula Grants..........	78,804	78,111	65,000
00.03 Rural Transportation Assistance..	4,659	6,197	5,000
10.00 Total obligations (Object class 41.0)........	1,729,054	1,800,000	1,363,080
Financing:			
17.00 Recovery of prior year obligations....................	-65,545	...	...
21.40 Unobligated balance available, start of year....................	-521,183	-461,170	-286,280
24.40 Unobligated balance available, end of year.....................	461,170	286,280	...
25.00 Unobligated balance lapsing......	1,505	...	...
39.00 Budget authority............	1,605,000	1,625,110	1,076,800
Budget authority:			
40.00 Appropriation....................	1,605,000	1,630,000	1,076,800
40.00 Reduction pursuant to P.L. 101-164....................	...	-4,890	...
43.00 Appropriation (adjusted)....	1,605,000	1,625,110	1,076,800
Relation of obligations to outlays:			
71.00 Obligations incurred, net........	1,729,054	1,800,000	1,363,080
72.40 Obligated balance, start of year.	4,539,360	4,089,643	3,959,704
74.40 Obligated balance, end of year...	-4,089,643	-3,959,704	-3,602,551
77.00 Adjustments in expired accounts..	-4,748	...	...
78.00 Adjustments in unexpired accounts	-65,545	...	...
90.00 Outlays.....................	2,108,478	1,929,939	1,720,233

PROGRAM AND PERFORMANCE STATEMENT

FORMULA GRANTS

This program provides block grants, by statutory formula, to State and local agencies for mass transportation capital and operating expenses.

The Administration proposes to eliminate operating assistance for urbanized areas of more than one million persons since these areas are far less dependent on federal assistance than are the smaller cities. Federal operating subsidies for areas over one million persons averages less than 6 percent of their total operating budgets.

The 1991 appropriation request of $1.077 billion includes: $709 million for capital grants, $65 million for nonurban areas under Section 18, $5 million for the Rural Transit Assistance Program (RTAP), and a $298 million operating assistance limitation to cities with populations of one million persons or less.

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

FORMULA GRANTS

Comparative Summary of Activity
(Dollars in Thousands)

	FY 1989 Actual	FY 1990 Estimate	FY 1991 Request
Appropriation	$1,605,000	$1,625,110	$1,076,800
Nonurbanized Formula Grants (Section 18)	66,404	65,535	65,000
Urbanized Formula Grants (Section 9)	1,533,596	1,554,590	1,006,800
Operating Assistance Cap (Section 9)	(804,692)	(802,278)	(297,800)
Rural Transportation Assistance Program (RTAP) [Section 18(h)]	5,000	4,985	5,000

Note: In addition to the amounts above, Section 9B trust fund capital is also allocated to all urbanized areas and states using the regular Section 9 apportionment factors to provide total formula funding as follows:

Section 9B (Trust Fund)	+ 70,000	+ 69,790	+ 70,000
Total formula funding	$1,675,000	$1,694,900	$1,146,800

The Urban Mass Transportation Act of 1964, as amended, provides a formula-allocated resource for mass transportation capital and operating assistance for urbanized areas under Section 9 and non-urbanized areas under Section 18. Both of these programs are funded from the general funds of the Treasury. In addition, the Surface Transportation and Uniform Relocation Assistance Act of 1987 (STURAA) authorized a formula program under Section 9B to be funded from the Mass Transit Account of the Highway Trust Fund. Trust fund formula under the Section 9B program may only be used for capital purposes.

FY 1991 Appropriation Request

The FY 1991 budget, within the constraints imposed by the Federal deficit, targets Federal transit assistance to maintaining capital infrastructure. Locally determined investments to maintain existing capital infrastructure are generally the most cost-beneficial use of limited Federal transit funds. Increased attention to capital infrastructure entails expanding State, local and private sector financing of major new capital projects by means of market and other financing tools. Increased regard for the infrastructure also requires significantly less emphasis on Federal operating subsidies.

For FY 1991, an appropriation of $1.077 billion is requested. After setting aside $5 million for the Rural Transportation Assistance Program, $1.072 billion will be available for the Sections 9 and 18 programs. The decrease from the 1990 level is due primarily to a proposed reduction in the Section 9 operating assistance caps from $802 million in FY 1990 to $298 million in FY 1991. In FY 1991, Section 9 urban formula capital assistance has been basically held harmless with FY 1990.

Operating Assistance

UMTA is proposing to eliminate operating assistance to the 30 largest urbanized areas of more than one million persons since these areas are far less dependent on Federal assistance than are the smaller cities. In New York, for example, Federal operating assistance represents only 2.8 percent of its total operating costs and in Chicago it is only 6.0 percent. In fact, the average for the 30 largest cities is 5.7 percent. However, in cities with populations of less than 200,000, Federal operating assistance averages 23.2 percent of their operating costs. For large cities with populations between 500,000 - one million, operating assistance averages 16.8 percent of total operating costs.

Furthermore, operating costs are the result of local collective bargaining, fares and service policies over which the Federal government has no control. The Federal government should not be required to subsidize those activities whose costs are largely determined by the local decision-making process.

Finally, the smaller areas have average operating costs well below those in the larger areas. For example, in 1987, bus operating costs in areas over one million in population averaged $57.41 per vehicle hour compared with only $32.84 per hour in areas under 200,000. Thus, the smaller areas are more efficient in utilizing their Federal assistance.

UMTA proposes that the appropriated operating assistance caps be cut $504 million to a national total of $298 million. The following table shows these reductions by city size grouping:

(In millions of dollars)

Population	FY 1990 Actual	FY 1991 Proposed	FY 1991 Over/(Under) FY 1990
Over 1 million	$ 508.2	$ 0	$(508.2)
200,000 - 1 million	150.6	150.6	0
50,000 - 200,000	143.5	147.2	3.7
Total	$ 802.3	$ 297.8	$(504.5)

Urban Formula Capital Grants

As shown in the table below, our budget request basically holds formula capital harmless at the FY 1990 level. Measured against the FY 1990 funding level, there is a slight $43 million reduction in total formula capital assistance. That is, almost all of the proposed $548 million formula reduction is in formula operating assistance ($504 million) for the largest cities. This negligible 5 percent cut in formula capital assistance should not have any effect on bus and rail modernization capital investment in the transit infrastructure:

(In millions of dollars)

	FY 1990 Estimate	FY 1991 Proposed	FY 1991 Over/(Under) FY 1990
Appropriation	$1,625	$1,077	$ (548)
Less: RTAP [18(h)]	- 5	- 5	...
Section 18	- 66	- 65	(1)
Section 9 operating assistance cap	- 802	-298	(504)
Available for capital - Section 9 (GF) only	752	709	(43)
Plus: Section 9B (TF)	70	70	+ 0
Total available formula capital	$ 822	$ 779	$(43)

Urban Formula Capital (Section 9B Trust Fund)

The STURAA provides that 50 percent of the funds authorized and made available in excess of $1 billion under the Discretionary Grants account is to be allocated under the Section 9B formula grant program for capital purposes. We refer to this amount in excess of the $1 billion as the "blend." For FY 1991, the obligation limitation totals $1.14 billion which means that if made available, half of the $140 million blend, or $70 million, would be apportioned to all urbanized areas and states under the Section 9B program. In providing for the apportionment of trust funds using the Section 9 apportionment factors, Congress recognized the need for a wider, more equitable distribution of this dedicated tax resource.

Nonurbanized Formula Grants (Section 18)

Funding is apportioned to the States by a legislatively mandated formula based on each State's share of rural population. Funds are available for technical assistance, planning, research, administration, capital, and operating costs. Each Governor has designated a State agency responsible for administering the program within the State. In accordance with the Section 18 legislation, each State may use its entire apportionment for operating expenses if it so desires. By statute, 2.93 percent of Formula Grants funding (general fund and trust fund combined) is to be apportioned to the States to assist local public bodies, nonprofit organizations and public transportation providers in small urban and rural areas of less than 50,000 in population. The STURAA also provides that the Section 18 program receive the equivalent of 2.93 percent of the $70 million of Section 9B funding, but those funds must be derived from general funds, not from the trust fund. Thus, the Section 18 funding for FY 1991 is calculated as follows:

Formula Grants appropriation request	$1,076.8 million
Less:RTAP	-5.0
Balance	$1,071.8
2.93 percent of Formula Grants (GF)	30.4
2.93 percent of Section 9B (TF) <$70 M>	2.1
Hold harmless add-on	32.5
Total available for Section 18	65.0

For FY 1991 we are proposing that the pure 2.93 percent of formula funding available for Section 18 be supplemented by an add-on of $32.5 million in order to reach this program's funding at the FY 1991 level of $65 million, or 5.7 percent of formula funding.

If this program were not supplemented by an absolute amount of funding, its level would be only $32.5 million and it would suffer a 49 percent cut compared to the 1989 level. A reduction of this magnitude is too drastic for these smaller areas to absorb given that the Section 18 recipients obligate in excess of $80 million per year. These extra obligations over the appropriated $65 million level result from transfers at the direction of the Governors from the Section 9 program to more pressing rural needs under Section 18.

Rural Transportation Assistance Program (RTAP)

In accordance with the STURAA, $5 million is to be available for RTAP under Section 18(h). This program will continue to provide funding through grants or contracts for transit research, technical assistance, training, and related support services in nonurbanized areas of less than 50,000 in population. Since this program serves the same constituents as the regular Section 18 program, UMTA has chosen to allocate about 85 percent of this funding to all States. States may use funds allocated to them for eligible activities based upon their own individual needs and plans. A small 15 percent set-aside is used for the development of training materials, and the development and maintenance of a national clearinghouse on rural activities.

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DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
MISCELLANEOUS EXPIRED ACCOUNTS
Program and Financing (in thousands of dollars)

Identification code 69-9913-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
00.01 Waterborne and Jobs Bill........	1,006	1	...
10.00 Total obligations...........	1,006	1	...
Financing:			
17.00 Recovery of prior year obligations......................	-6,876	...	...
21.40 Unobligated balance available, start of year....................	-1,007	-1	...
24.40 Unobligated balance available, end of year.....................	1	...	...
25.00 Unobligated balance lapsing......	6,876	...	...
39.00 Budget authority (Appropriation)............	...	...	...
Relation of obligations to outlays:			
71.00 Obligations incurred, net........	1,006	1	...
72.40 Obligated balance, start of year.	392,555	251,467	121,468
74.40 Obligated balance, end of year...	-251,467	-121,468	-1
78.00 Adjustments in unexpired accounts	-6,876	...	...
90.00 Outlays....................	135,219	130,000	121,467

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300-101

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
MISCELLANEOUS EXPIRED ACCOUNTS
STATUS OF DIRECT LOANS (in thousands of dollars)

Identification code 69-9913-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
SOUTHEASTERN PENNSYLVANIA TRANSIT AUTHORITY			
Cumulative balance of direct loans outstanding:			
1210 Outstanding, start of year.....	267	267	...
1251 Repayments: Repayments and prepayments..................	...	-267	...
1290 Outstanding, end of year.......	267	...	...
WASHINGTON METROPOLITAN TRANSIT AUTHORITY			
Cumulative balance of direct loans outstanding:			
1210 Outstanding start of year.....	177,000	177,000	177,000
1290 Outstanding, end of year.......	177,000	177,000	177,000
([illegible]: 28.8)	([illegible]: 8)	([illegible]: 8)	([illegible]: 4.8)

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DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
MISCELLANEOUS EXPIRED ACCOUNTS
STATUS OF GUARANTEED LOANS (in thousands of dollars)

Identification code 69-9913-0-1-401	19 89 actual	19 90 estimate	19 91 estimate
Cumulative balance of guaranteed loans outstanding:			
2210 Outstanding, start of year.....	820,000	820,000	820,000
2290 Outstanding, end of year.......	820,000	820,000	820,000
MEMORANDUM			
2299 U.S. contingent liability for guaranteed loans outstanding, end of year............	820,000	820,000	820,000
(Mdse mst: [illegible])	(Mdse mst: [illegible])	(Mdse mst: [illegible])	(Mdse mst: [illegible])

PROGRAM AND PERFORMANCE STATEMENT

MISCELLANEOUS ACCOUNTS

These schedules display programs that no longer require appropriations and thus reflect obligations and outlays made under prior year appropriations. Among these programs is the general funded appropriation for Discretionary Grants for 1983 and earlier years.

The schedules also show a Federal direct loan to the Southeastern Pennsylvania Transit Authority, and the Federal Government's guarantee of bonds sold to support the construction of the Washington Metrorail system.

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

MISCELLANEOUS ACCOUNTS

Comparative Summary of Activity
(Dollars in Thousands)

	FY 1989 Actual	FY 1990 Estimate	FY 1991 Estimate
Appropriation	...	...	...
Obligations	$ 1,006	1	...
Outlays	$135,219	$130,000	$121,467

This account is comprised of previously appropriated funds for the General Fund portion of Discretionary Grants (which was funded from the Mass Transit Account of the Highway Trust Fund starting in 1984) and the Waterborne Demonstration program. These are programs that no longer receive appropriations and thus this account reflects only obligations and outlays made under prior fiscal year appropriations.

APPROPRIATION LANGUAGE

DISCRETIONARY GRANTS

(LIMITATION ON OBLIGATIONS)

(HIGHWAY TRUST FUND)

None of the funds in this Act shall be available for the implementation or execution of programs in excess of $1,140,000,000 in fiscal year [1990] 1991 for grants under the contract authority authorized in section 21(a)(2) and (b) of the Urban Mass Transportation Act of 1964, as amended (49 U.S.C. 1601 et seq.): Provided, That the funds available under this head for new fixed guideway systems and extensions to fixed guideway systems shall be limited to $285,000,000 for the Los Angeles Metro Rail project, $23,000,000 for the Miami, Florida Downtown People Mover extensions, $72,000,000 for the St. Louis Metrolink project, and $18,000,000 for the Denver Busway project. (Department of Transportation and Related Agencies Appropriations Act, 1990.)

MASS TRANSIT CAPITAL FUND

(LIQUIDATION OF CONTRACT AUTHORIZATION)

(HIGHWAY TRUST FUND)

For payment of obligations incurred in carrying out section 21(a)(2) and (b) of the Urban Mass Transportation Act of 1964, as amended (49 U.S.C. 1601 et seq.), administered by the Urban Mass Transportation Administration, [$900,000,000] $815,000,000, to be derived from the Highway Trust Fund and to remain available until expended. (Department of Transportation and Related Agencies Appropriations Act, 1990.)

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DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
DISCRETIONARY GRANTS - TRUST FUND
Program and Financing (in thousands of dollars)

Identification code 69-8191-0-7-401	19 89 actual	19 90 estimate	19 91 estimate
Program by activities:			
Direct program:			
00.01 Discretionary grants...........	1,267,841	1,699,597	1,070,000
00.02 Formula grants.................	71,320	90,581	70,000
00.91 Total direct program..........	1,339,161	1,790,178	1,140,000
01.01 Reimbursable program.............	226	...	...
10.00 Total obligations (Object class 41.0)........	1,339,387	1,790,178	1,140,000
Financing:			
11.00 Offsetting collections from: Federal funds..................	-226	...	...
17.00 Recovery of prior year obligations.....................	-28,924	...	...
21.49 Unobligated balance available, start of year: Contract authority.......................	-1,045,927	-985,690	-477,312
24.49 Unobligated balance available, end of year: Contract authority......................	985,690	477,312	737,312
39.00 Budget authority...........	1,250,000	1,281,800	1,400,000
Budget authority:			
Current:			
40.00 Appropriation..................	400,000	900,000	815,000
40.00 Reduction pursuant to P.L. 101-164..................	...	-2,700	...
40.49 Portion applied to liquidate contract authority............	-400,000	-897,300	-815,000
43.00 Appropriation (adjusted)	...	...	...
49.00 Reduction pursuant to P.L. 99-177..............	...	-18,200	...
Permanent:			
69.10 Contract authority (Public Law 100-17)..................	1,250,000	1,300,000	1,400,000
Relation of obligations to outlays:			
71.00 Obligations incurred, net........	1,339,161	1,790,178	1,140,000
Obligated balance, start of year:			
72.40 Appropriation..................	982,903	534,394	455,308
72.49 Contract authority.............	1,713,973	2,624,211	3,517,089
Obligated balance, end of year:			
74.40 Appropriation..................	-534,394	-455,308	-174,921
74.49 Contract authority.............	-2,624,211	-3,517,089	-3,842,089
78.00 Adjustments in unexpired accounts	-28,924	0	0
90.00 Outlays.....................	848,508	976,387	1,095,387

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DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION
DISCRETIONARY GRANTS - TRUST FUND
STATUS OF UNFUNDED CONTRACT AUTHORITY

(in thousands of dollars)

Identification code 69-8191-0-7-401	19 89 actual	19 90 estimate	19 91 estimate
Unfunded balance, start of year........	2,759,900	3,609,900	3,994,400
Contract authority.....................	1,250,000	1,300,000	1,400,000
Reduction pursuant to P.L. 99-177..........................	...	-18,200	...
Appropriation to liquidate contract authority..................	-400,000	-897,300	-815,000
Unfunded balance, end of year..........	3,609,900	3,994,400	4,579,400

PROGRAM AND PERFORMANCE STATEMENT

DISCRETIONARY GRANTS

The discretionary grants program is used to fund selected bus projects, rail modernization projects and new subway and light rail systems. In addition, a small amount of discretionary funds is used to support planning, innovative techniques, and special elderly and handicapped transportation services. Together with formula grants, funds are available in 1991 to help transit authorities address requirements to improve air quality and increase access to transit services for disabled individuals.

The 1991 budget proposes $985 million for discretionary capital grants to be allocated as follows: $193 million for bus projects, $394 million for rail modernization and $398 million for new starts. Since the mass transit reauthorization ends in 1991, new starts funding is only proposed for projects with full funding contracts and with funding requirements which can be accommodated in 1991 with available funds. Funding for other new rail systems should be addressed within the context of the 1992 reauthorization. The 1991 budget also proposes $45 million for Planning, $35 million for Elderly and Handicapped and $5 million for Transportation Centers.

DEPARTMENT OF TRANSPORTATION
URBAN MASS TRANSPORTATION ADMINISTRATION

DISCRETIONARY GRANTS
(TRUST FUND)

Comparative Summary of Activity
(Dollars in Thousands)

	FY 1989 Actual	FY 1990 Estimate	FY 1991 Request
Contract Authority	$1,250,000	$1,281,800	$1,400,000
Obligation Limitation	1,140,000	1,136,580	1,140,000
Liquidating Cash Appropriation	(400,000)	(897,300)	(815,000)

OBLIGATION LIMITATION

The Discretionary Grants program provides financial assistance for capital and planning investments in the mass transportation infrastructure. Because Section 9 and Section 18 Formula Grants provide resources for most routine capital needs, Section 3 Discretionary Grants have been traditionally employed for major or extraordinary investments in the mass transit infrastructure. Discretionary funding includes Rail Modernization, major bus investments, and New Starts. Funding for the Discretionary Grants program is also used under the authority of Sections 8 and 16(b)(2), to carry out the Planning and Elderly and Handicapped programs.

The 1987 STURAA reauthorization created a Section 9B formula "Blend" program to more equitably distribute a portion of the trust fund resource. Congress has used the addition of these trust funded Formula Blend funds to offset reductions in the appropriations for the general funded Formula Grants Program. However, the bulk of the trust fund resources remains discretionary. (The FY 1990 funding levels reflect a 0.3 percent reduction as a result of the drug assessment.)

The 1987 STURAA reauthorization is in effect through the end of FY 1991. STURAA specifies that the allocation of the Section 3 resource is 40 percent for New Starts, 40 percent for Rail Modernization, 10 percent for bus-related investments, and

and 10 percent unallocated to be distributed among the previous three categories, as determined by the Secretary. Our Section 3 Discretionary Grants proposal complies with all of these requirements. The New Starts program would be limited, in the last year of STURAA, to the construction of new fixed guideway facilities in those four urbanized areas where such projects are currently under, or soon to be under, full funding agreements. Other New Start projects would not be funded in 1991. Their funding requirements will be considered within the context of the 1992 highway-transit reauthorization. In addition, Section 3 funding would be used for modernization work on older rail transit systems. Finally, while bus-related investment can largely be met through the Section 9 and Section 18 program, there is justification for supplemental bus funds from Section 3. In FY 1991, these additional bus funds are proposed to carry out important programmatic initiatives such as alternative fuels for transit buses and improved facilities for providing accessibility to the disabled.

In FY 1991, we propose to increase the use of Section 3 bus capital to assist metropolitan areas with populations over one million to meet the 1991 Alternative Fuels (AF) requirements for transit buses in the President's proposed Clean Air Act legislation. For example, these resources could be applied toward the modification of 300 buses (representing approximately 10 percent of the annual bus buy), and the modification of 40 bus facilities to accommodate alternative fuels such as compressed natural gas and methanol. In addition, we propose to use Section 3 funds to defray certain incremental costs associated with the accessibility requirements of the Presidentially endorsed Americans with Disabilities Act of 1989 (ADA). Incremental costs of making buses which conform with the proposed ADA's lift requirements is an example of how such funds would be used.

As shown below, we are requesting an obligation limitation of $1.14 billion for trust fund activity. Under the STURAA, this would result in a $1.07 billion program for Discretionary Grants and $70 million for Formula Grants under Section 9B. This same obligation limitation level was appropriated in FY 1989 and FY 1990 (prior to the drug assessment and Gramm-Rudman-Hollings sequestration).

(In millions of dollars)

	FY1990 Approp.	FY1991 Request
OBLIGATION LIMITATION	$1,136	$1,140
LESS: FORMULA BLEND (9B)	70	70
TOTAL DISCRETIONARY	1,066	1,070
SECTION 3 CAPITAL	982	985
RAIL MOD	(431)	(394)
NEW STARTS	(419)	(398)
BUS	(132)	(193)
ELDERLY & HANDICAPPED	35	35
PLANNING	44	45
UNIVERSITY TRANSPORTATION CENTERS	5	5

DISCRETIONARY GRANTS

The Discretionary Grants program is sensitive to the way in which local authorities choose to use the Section 9 program. Section 9 allows transit operators to upgrade and replace rolling stock, to refurbish systems and structures, to build new maintenance facilities, to enhance passenger amenities, to purchase specialized equipment for elderly and handicapped passengers, and in some cases, to expand mass transit service into new markets. To the extent the Section 9 program can play such a role, the Discretionary Grants program becomes the resource for extraordinary investment in transit infrastructure for those urbanized areas that require and can justify the additional funding to their formula apportionment.

In FY 1991 there would be three categories of major capital investment under the Discretionary Grants program, plus a fourth category for planning and other activities. The Formula Blend

Program is discussed under the heading Formula Grants. At the $1.07 billion level, UMTA proposes funding for each category as specified in the following paragraphs.

Section 3 Capital

The STURAA of 1987 specifies that the allocation of the requested $985 million Section 3 capital portion of the Discretionary Grants program shall be 40 percent to rail modernization, 10 percent to bus and bus related facilities, 40 percent to new fixed guideway systems, and 10 percent unspecified (unallocated). The unallocated 10 percent is to be distributed among these preceding three categories at the discretion of the Secretary. The allocations for FY 1991 are proposed in conformance with the percentages contained in the statute. In FY 1991, we propose to devote virtually all of the 10 percent unallocated to the bus category to support the President's proposed Alternative Fuels and improved accessibility for the disabled transit initiatives.

A. Rail Modernization (Section 3) $394 million

Our immediate goal for the rail modernization program is to stabilize rail systems from further deterioration and to continue restoration of these systems. This task is estimated to require a significant annual Federal contribution of capital investment. A large portion of this can be accommodated under the Section 9 formula at the requested level. However, some Section 3 resources will also be needed. UMTA is proposing to allocate $394 million for rehabilitating older rail systems. This amount, coupled with approximately $356 million from Section 9, will produce a total FY 1991 rail modernization program of approximately $750 million. This $750 million, when coupled with the statutorily required minimum local match (25 percent for Discretionary Grants and 20 percent for Formula Grants), should provide approximately $1 billion for rail modernization. In addition, Interstate Transfer funds are used for rail modernization; and cities like New York use local funding for rail modernization, independent of the Federal program. Based on the Rail Modernization Study, current annual need to restore the entire rail system, over a period of ten years, is about $2.2 billion in current (1989) dollars. That study also indicated that, at least, between 70 and 80 percent of the benefit of restoring the nation's rail system can be achieved by a $1 billion level of funding. The benefits would range, at least, between 80 and 90 percent, if Interstate Transfer funds and local funding, separate from the Federal program, were included in the calculations. The unmet infrasturcture need consists of a limited number of very expensive projects on lines that are not heavily used.

The largest cost of maintaining the transit infrastructure is the cost of restoring existing rail facilities and equipment, particularly in older rail cities like New York, Chicago, Philadelphia, northeast New Jersey, Boston, San Francisco, Pittsburgh and Cleveland. The key to restoring these systems is carefully selecting those segments of the systems for restoration where restoration is warranted on the basis of benefits. In cases where the cost of restoration is not justified, alternative means of serving the transit market should be considered.

Increased attention to capital infrastructure entails expanding State, local and private sector financing of major new capital projects by means of public/private development projects, benefit assessment districts and other market financing tools. Increased regard for the infrastructure also requires significantly less emphasis on Federal operating subsidies for these largest transit authorities.

B. Bus and Bus Related (Section 3) $193 million

Bus systems play a vital role in the mass transportation systems of nearly all cities. Of 373 urbanized areas in the country, 328 provide mass transit service and approximately 95 percent of these do so through bus transit only. Over 70 percent of all transit passenger trips are provided by buses.

Bus and bus related projects are eligible for funding under the Sections 3, 9 and 18 programs. They are also eligible under the Interstate Transfer Grants and Federal-Aid Urban System programs.

UMTA is proposing a total of $193 million for the Section 3 Bus capital program in FY 1991. To accommodate a variety of extraordinary bus capital improvements which the formula-apportioned Section 9 resources may not be able to accommodate, the UMTA recommendation, compared to FY 1990, would increase the bus activity by $60 million. This increase is targeted to improve access to transit for the disabled and to comply with proposed Clean Air (alternative fuels for transit buses) legislation. The addition of the $193 million of Section 3 bus funding to that portion of the Section 9 formula capital dedicated to bus-related investments would total about $613 million.

We propose to use much of the Section 3 resource to defray certain incremental costs associated with the accessibility requirements of the Presidentially endorsed Americans with Disabilities Act of 1989 (ADA), which would make mass transportation systems accessible to the disabled. Funding would be made available to add lifts to buses for the disabled and to meet the accessibility requirements of the ADA.

UMTA's Alternative Fuels Initiative (AF) research program was originally announced in September, 1988, to reflect UMTA's commitment to support the Environmental Protection Agency's (EPA) 1991 bus emissions requirements. In support of the President's Clean Air Bill, UMTA's alternative fuels role will be dramatically increased to help implement the 1991 - 1994 phase-in of alternative fuels requirements for new transit bus purchases in metropolitan areas with populations in excess of one million persons. A substantial portion of Section 3 resources will be made available to fund the incremental capital costs associated with the phased-in purchase of new alternative fuel transit buses and the bus garage modifications needed to accommodate AF engine maintenance. Alternative fueled buses will provide an opportunity for transit systems to take a leadership position in the nation's battle for clean air, consistent with the President's new clean air proposals.

C. New Fixed Guideway Systems and Extensions (New Starts) $398 million

Approximately $398 million in Section 3 Discretionary Grants funds is proposed to be allocated in FY 1991 for new fixed guideway systems and extensions. The statutory matching requirement for Section 3 Discretionary Grants is 75 percent Federal/25 percent local. However, due to the Department's efforts to encourage higher local shares, many cities have increased their match to as high as 50 percent.

Given the Department's intent to fulfill, to the maximum extent possible, all Federal commitments in the final year of the current mass transit authorization, UMTA will propose appropriation language to fund only those four new start projects that have, or will soon have, full funding agreements. Appropriation language is being proposed to limit New Start funding to: 1) St. Louis Metrolink, $72 million; 2) Denver Busway project, $18 million; 3) Miami, Florida Downtown People Mover extensions, $23 million; and 4) the Los Angeles Metrorail project, $285 million. These dollar amounts have been rounded upwards and will be reduced 0.5 percent for project management oversight assessment. These four projects would exhaust the full $398 million available in authorized funds for New Starts in FY 1991. This has the effect of fully funding the St. Louis, Denver and Miami New Start projects, and leaving Los Angeles with a balance due of $52.4 million. Additional New Start funding will be considered in the deliberations of the 1992 highway-transit authorization.

D. Planning and Other

This part of the FY 1991 budget request for $85 million for Discretionary Grants proposes $45 million for the Planning program, $35 million for the Elderly and Handicapped program, and $5 million funding for University Transportation Centers. These levels are consistent with the Discretionary Grants authorization.

Planning (Section 8) $45 million

The Discretionary Grants program provides the funding to finance planning and technical studies. The FY 1991 request for $45 million will sustain previous funding levels designed to carry out comprehensive transportation planning at the local level. The $45 million requested is the same level as appropriated in FY 1989 and FY 1990, prior to the drug assessment and Gramm-Rudman-Hollings reductions. In FY 1990, the Department plans to restore to the Planning program the full $630,000 reduction taken as a result of Gramm-Rudman and the 0.3 percent drug assessment reductions. The Planning program would be funded at $45 million in FY 1990, primarily from new budget authority and $630,000 derived from deobligated Discretionary funds.

UMTA will provide Section 8 funds to State and local officials primarily on the basis of a 1980 census population-based distribution formula. These funds are available for planning, engineering, and evaluating public transportation projects and for implementing other specialized technical studies. Such funds will be used to ensure that Federal capital and operating funds are utilized for transportation systems that embrace a region-wide perspective and are based on priorities established by local governments.

These funds will also be used to ensure appropriate focus on critical national priorities during the planning and programming of transportation facilities such as alternative fuel evaluations. In accordance with STURAA, these funds may also be used by grantees to conduct long term financial planning. UMTA may also use Section 8 to fund the Section 15 transit data collection program.

The program also supports special studies on subjects of national concern. For FY 1991, there are five major special studies emphasis areas: Elderly and Handicapped Accessibility; Clean Air Planning; Suburban Mobility; Safety and Drug Control; and Census data updates.

At the option of the designated recipient, Section 9 funds are also available to supplement Section 8 funds to carry out needed planning studies. During FY 1988 and FY 1989, grantees used approximately $15 million of Section 9 funds to conduct planning activities.

Elderly and Handicapped [Section 16(b)(2)] $35 million

Section 16(b)(2) of the Urban Mass Transportation Act of 1964, as amended, requires that special efforts be made in the planning and design of mass transportation facilities and services so that elderly and handicapped persons are assured mass transportation services that they can effectively utilize. This program provides capital funding to assist in the provision of service by non-profit providers. Funds are allocated annually to the States by administrative formula based on each State's share of the elderly and handicapped population. The program is administered at the

State level by a designated State agency. The FY 1991 request for this program is $35 million, the same as the FY 1989 funding level and the FY 1990 level, prior to drug assessment and Gramm-Rudman-Hollings reductions. Using the same approach as was used for the Planning program in FY 1990, the Department will use $490,000 of deobligated Discretionary funds to offset the Gramm-Rudman and drug reductions on the Elderly and Handicapped program in FY 1990.

University Transportation Centers [Section 11(b)] **$5 million**

University Transportation Centers were established in each of the ten Federal regions as a result of Section 11(b) in the 1987 STURAA. For FY 1991, a $5 million appropriation is requested for these University Transportation Centers. The ten University Transportation Centers which have been established have the potential of providing high quality research to address regional and national transportation concerns. The Centers also have the potential for addressing the critical needs for education in transportation by providing training opportunities for transportation professionals and attracting promising students to the field of transportation. A concerted effort will be made in FY 1991 to devote more of the research and training conducted in the Transportation Centers to mass transit issues.

LIQUIDATION OF CONTRACT AUTHORIZATION

Because the Surface Transportation and Uniform Relocation Assistance Act of 1987 provides contract authorizations against the Mass Transit Account of the Highway Trust Fund, appropriations of liquidating cash are required to make outlays for prior and current year obligations. For FY 1991, outlays are anticipated to total $1,095 million, therefore, a liquidating cash appropriation of $815 million will be required for FY 1991.

The following table summarizes the current status of cash appropriated from the Mass Transit Account for the Discretionary Grants program.

STATUS OF LIQUIDATING CASH
DISCRETIONARY GRANTS (TRUST FUND)

(In thousands of dollars)

Cash balance, end of FY 1988	$ 982,903
Liquidating cash appropriation, FY 1989	400,000
Total cash available, FY 1989	1,382,903
Less: Actual outlays, FY 1989	-848,508
Cash balance, end of FY 1989	534,395
Liquidating cash appropriation, FY 1990	897,300
Total cash available, FY 1990	1,431,695
Less: Estimated outlays, FY 1990	-976,387
Cash balance, end of FY 1990	455,308
Liquidating cash requested, FY 1991	815,000
Total cash available, FY 1991	1,270,308
Less: Estimated outlays, FY 1991	-1,095,387
Cash balance, end of FY 1991	174,921

MASS TRANSIT ACCOUNT
OF THE
HIGHWAY TRUST FUND

The status of the Mass Transit Account is as follows:

STATUS OF MASS TRANSIT ACCOUNT

(in thousands of dollars)

	1989 Actual	1990 Estimate	1991 Request
Unexpended balance brought forward, start of year:	5,167,560	6,057,342	6,944,655
Cash income during the year, Governmental receipts:			
Motor fuel taxes	1,269,420	1,311,000	1,345,000
Interest on investments	468,869	552,700	581,600
Total annual income	1,738,289	1,863,700	1,926,600
Cash outgo during the year (liquidation of contract authorization):	-848,508	-976,387	-1,095,387
Unexpended balance carried forwarded, end of year	6,057,342	6,944,655	7,775,868

NATIONAL
TRANSPORTATION
SAFETY
BOARD

FISCAL YEAR
FY 1991 BUDGET

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MISSION AND AUTHORITY

The National Transportation Safety Board is an independent agency charged with determining the probable cause(s) of transportation accidents and promoting transportation safety. The Board investigates accidents, conducts safety studies, evaluates the effectiveness of other government agencies' programs for preventing transportation accidents, and reviews appeals of adverse actions by the Administrators of agencies of the Department of Transportation involving airman and seaman certificates and licenses.

Most importantly, the Board makes safety recommendations, based on its investigations and studies, to Federal, State and local government agencies and to the transportation industry regarding actions that should be taken to prevent accidents. Safety recommendations are the focal point of the Board's efforts to improve safety in the transportation system.

Although the Board's charter is the Independent Safety Board Act of 1974, its origins can be found in the Air Commerce Act of 1926, in which Congress charged the Commerce Department with investigating the causes of aircraft accidents. Since 1967 the Board has investigated accidents in all modes of transportation including aviation, highway, marine, rail, and pipeline.

The Board has no authority to regulate the transportation industry. Therefore, its effectiveness depends on its reputation for timely and accurate determination of accident causation and for issuing realistic and feasible safety recommendations to satisfy the public's demand for prompt implementation of safety improvements.

Although the missions and authorities of other Federal agencies include fostering and ensuring the safety of the U.S. transportation system, the independent oversight role of the Safety Board is essential in prompting compliance with those agencies' roles by thorough and timely investigations and recommendations to prevent future accidents. (For additional information regarding the Board's mission and authority as compared with other organizations see "The Role of the Safety Board and Other Organizations in Transportation Safety" included in the additional data section of this document.)

APPROPRIATION LANGUAGE

Salaries and Expenses

For necessary expenses of the National Transportation Safety Board, including hire of passenger motor vehicles and aircraft; services as authorized by 5 U.S.C. 3109, but at rates for individuals not to exceed the per diem rate equivalent to the rate for a GS-18; uniforms or allowances therefor, as authorized by law (5 U.S.C. 5901-5902), [$27,600,000] $30,940,000 of which not to exceed $500 may be used for official reception and representation expenses. (Department of Transportation and Related Agencies Appropriation Act, 1990; additional authorizing legislation to be proposed.)

SALARIES AND EXPENSES
Program and Financing (in thousands of dollars)

Identification Code: 95-0310-0-1-407	1989 Actual	1990 Estimate	1991 Estimate
Program by activities:			
00.01 Policy and Direction	3,030	3,230	3,610
00.02 Accident Investigation	11,640	12,421	13,990
00.03 Technology	6,110	6,690	7,930
00.04 Safety Programs	2,000	2,140	2,270
00.05 Administration	1,570	1,680	1,770
00.06 Administrative Law Judges	1,010	1,070	1,370
10.00 Total Obligations	25,360	27,231	30,940
Financing:			
40.00 Budget Authority (Appropriation)	25,360	27,231	30,940
Budget Authority:			
40.00 Appropriation	25,360	27,600	30,940
40.00 Reduction Pursuant to P.L. 99-177	--	-369	--
43.00 Appropriation (adjusted)	25,360	27,231	30,940
Relation of Obligations to Outlays:			
71.00 Obligations Incurred, Net	25,360	27,231	30,940
72.40 Obligated Balance, Start of Year	1,601	2,348	2,449
74.40 Obligated Balance, End of Year	-2,348	-2,449	-2,783
77.00 Adjustments in Expired Accounts	-135	--	--
90.00 Outlays, Excluding Pay Raise Supplemental	24,478	27,130	30,606

SALARIES AND EXPENSES
Object Classification (in thousands of dollars)

Identification Code: 95-0310-0-1-407		1989 Actual	1990 Estimate	1991 Estimate
	Personnel Compensation and Benefits:			
11.1	Permanent positions	14,407	15,502	17,306
11.3	Positions other than permanent	241	255	269
11.5	Other personnel compensation	649	679	739
11.8	Special personal services payments	37	39	42
	Total personnel compensation	15,334	16,475	18,356
12.1	Personnel benefits: Civilian	2,499	2,884	3,449
	Total personnel compensation and benefits	17,833	19,359	21,805
	Other than personnel compensation and benefits:			
21.0	Travel and transportation of persons	1,417	1,488	1,682
22.0	Transportation of things	88	92	102
23.1	Standard level user charges	2,038	2,123	2,356
23.2	Rental payments to others	107	112	116
23.3	Communications, utilities, and miscellaneous charges	854	896	994
24.0	Printing and reproduction	454	477	529
25.0	Other services	1,799	1,899	2,234
26.0	Supplies and materials	232	243	270
31.0	Equipment	515	541	851
42.0	Insurance claims and indemnities	23	1	1
99.9	Total obligations	25,360	27,231	30,940

Personnel Summary:

	1989 Actual	1990 Estimate	1991 Estimate
Full-time equivalent employment (FTE)	324	326	348
FTE of overtime and holiday hours	10	10	10

EMERGENCY FUND
Program and Financing (in thousands of dollars)

Identification Code: 95-0311-0-1-407	1989 Actual	1990 Estimate	1991 Estimate
Financing:			
21.40 Unobligated balance available, start of year	-709	-709	-709
24.40 Unobligated balance available, end of year	709	709	709
39.00 Budget authority	--	--	--
Relation of Obligations to Outlays:			
71.00 Obligations Incurred, Net	--	--	--
90.00 Outlays	--	--	--

ANALYSIS OF CHANGES
FY 1990 to 1991

$ 1,810,000 ....22 FTE Position Increase (326-348)

The increased staffing provides for 18 workyears dedicated to enhancing the Board's Accident Investigation and Technology programs, whose primary mission is to improve transportation safety through the prompt and thorough investigation of transportation accidents. This additional staffing will improve the staffing depth in several of the Board's critical technical and investigator functions. Four additional workyears will allow the Board's aviation appeal function to cope with a doubling of their workload due to increased license enforcement actions by the FAA. The cost projection includes non-salary costs associated with the increased staff.

$ 344,000 ....Inflation

Based on OMB's latest economic assumptions, an inflation rate of 4.0 percent is anticipated for FY 1991. This factor is applied to all non-personnel costs.

$ 244,000 ....Civilian Benefits

The requested funds will cover an expected 8.1 percent increase in civilian benefits costs. Specifically, health benefit premiums are expected to increase approximately 25 percent in FY 1991 based on FY 1988 and FY 1989 increases of 31 percent and 24 percent, respectively. In addition, higher retirement contributions are expected due to increased numbers of employees being covered by the more expensive Federal Employees Retirement System (FERS). FERS costs are 12.9 percent of salaries plus up to 5 percent for Thrift Savings; whereas the old Civil Service Retirement System cost only 7 percent of salaries.

$ 81,000 ....Training

Our current lack of resources prevents us from adequately training our staff to ensure their technical and operational currency, and professional expertise. The Safety Board's programs must be responsive to rapid changes in both transportation technology and safety issues. Even now, aircraft and other transportation vehicles are becoming more and more sophisticated, while the Safety Board's technical expertise stagnates. With these additional resources, the Board will begin to provide funding for this crucial training which will ensure that our staff is equipped with the tools it needs to maintain the high level of expertise and professionalism that is vital to the Board's effectiveness.

$ 15,000 ....Annual Medical Examinations

Safety Board accident investigations are conducted under strenuous conditions for long periods of time, sometimes in extreme climate conditions, and in remote and/or hostile environments. It is, therefore, imperative that Board employees who are involved in on-scene accident investigations be in excellent health, both physically and mentally. Accordingly, as part of a comprehensive health and safety program, the Safety Board is instituting a program whereby all its employees who participate in accident investigations will be required to pass a medical examination at least once every three (3) years. It is expected that about 80 employees per year will require examinations at a cost of approximately $190 per employee.

$ 10,000 ....Drug Program

Executive Order 12564 requires that each Federal agency covered by the Order have a Drug-Free Federal Workplace Plan that includes drug testing. Section 3(a) states that the head of each Executive agency shall establish a program to test for the use of illegal drugs by employees in sensitive positions. Section 3(b) also requires that each agency provide for "voluntary" testing.

Drug usage by Safety Board employees could preclude a systematic check of minute safety details in an investigation and, therefore, result in missed information which possibly could lead the Board to the wrong conclusion and, consequently, to inappropriate safety recommendations. This could result in serious damage to the Board's credibility with the public, the transportation industry, as well as other Government agencies and could severely undermine the Board's ability to promote transportation safety through effective, efficient accident investigations and safety recommendations. It is expected that about 20 percent of the Board's employees will be tested for drugs each year.

$ 30,000 ....Hepatitis B Vaccination Program

The Hepatitis B Vaccination Program is designed to protect Safety Board investigators from the Hepatitis virus as a result of their exposure to body tissue and human blood while investigating transportation accidents. The Public Health Service, Division of Federal Employee Occupational Health recommended that we implement such a program and will be responsible for the development, planning, and implementation of this program. Approximately 215 employees will be vaccinated under the program.

$ 250,000 ....Mainframe Computer Upgrade

The Board's current mainframe computer is 6 years old; however, the technology used for its design is more than 15 years old. With the tremendous technological advancements made over the past 15 years, the Board's computer is quickly approaching obsolescence.

In addition, the Safety Board has been notified by the computer vendor that no further operating system enhancements will be made for its computer. The Board also is anticipating that vendor-provided maintenance will be either curtailed or made very expensive within the near future. These items are a logical result of approaching computer obsolescence.

This situation, coupled with the fact that the Safety Board cannot make use of new networking software products that are now available on computers using newer technology, impedes the Board's progress toward improving its operational efficiency.

The amount requested would cover a portion of the software conversion costs associated with the purchase of a more technically advanced mainframe computer.

$ 805,000 ....Pay Raises

The requested funds will cover the FY 1991 effect of the anticipated January 1990 (3.6 percent) and January 1991 (3.5 percent) pay raises. Full absorption of these costs would require a reduction of approximately 10 FTE from the requested level.

$ 411,000 ....Promotions/Within Grade Increases

Expenses related to career promotions and within grade increases will cost approximately 2 percent of salaries in FY 1991.

$ - 291,000 ....Hire at Lower Grades

Wherever possible, the Safety Board will attempt to hire new employees at lower grades in order to offset a portion of the costs for promotions and within grade increases.

$ 3,709,000 ....Total Amount of Changes

Summary of Changes:

$27,231,000	FY 1991 Post-Sequester Level (326 FTE)
$ 3,709,000	Total Amount of Changes (22 FTE)
$30,940,000	FY 1991 Request (348 FTE)

22 POSITION JUSTIFICATION

The Safety Board has been faced for many years with a declining staff level and increasingly voluminous and complex workloads. Stemming this gradual erosion of our resources is critical to the continual effectiveness of our accident investigation program. In order to reverse this negative trend, the National Transportation Safety Board is requesting 22 additional positions (FTE) for fiscal year 1991.

Staffing Depth in Technical Specialties: 9 positions

In order to fulfill our vital transportation safety oversight role, we must enhance our staffing depth for each of our critical technical functions. For example, in some of the essential specialties such as helicopter engineering air carrier maintenance, intermodal chemical and toxicological analysis, and railroad engineer, our Bureau of Technology is staffed for only one position. These specialists are the typical "go-team" group chairmen who lead the various specialty groups during major accident investigations. When accidents occur simultaneously or back to back, we do not have the depth in these specialties to launch a complete multi-disciplinary go-team. In addition, there is a serious degradation in the timeliness of our reports when investigators regularly are forced to stop working on one accident to begin another. Further, investigators who are continually "on-call" repeatedly are faced with physical, emotional, and psychological demands which can adversely affect their performance. Just as important, our current lack of depth also prevents us from adequately training our technical staff to ensure their currency with the latest in state-of-the-art technologies. Even now, aircraft and other transportation vehicles are becoming more and more sophisticated, while the Safety Board's technical expertise stagnates. If sufficient resources are not provided, the Board will be unable to provide this vital training, and, as a result, it will have to rely more and more on the technical expertise of parties to its investigations (manufacturers, operators, and labor organizations) to determine the probable cause(s) of accidents involving these vehicles. This arrangement is not acceptable because it seriously jeopardizes the accuracy, objectivity, and ethical conduct of such investigations. Such a policy would result in a loss of public confidence in Federal transportation investigations and be detrimental to public safety.

Investigators-in-Charge: 9 positions

These additional positions will improve safety in aviation, railroad, and highway transportation through more complete investigations, more timely and well-written reports, and an increase in the number of safety improvement recommendations to correct identified safety problems.

Five senior investigators are required to enhance the Board's major aviation (3), railroad (1), and highway (1) programs. The limited number of senior investigators currently available has necessitated that we perform less detailed investigations in lieu of the more comprehensive investigations which lead to more productive safety improvements. Moreover, the Safety Board is unable to investigate in depth many airline incidents that were nearly major catastrophic accidents. Consequently, the valuable lessons to be learned from these incident investigations often remain undiscovered.

The Board's need for senior aviation investigators also affects adversely its ability to assist in major foreign accidents involving U.S. airlines and U.S. manufactured aircraft. Because of the international nature of aviation, any safety issue overlooked in a foreign investigation can adversely affect U.S. airline safety. The considerable growth in international airline operations, including the growth of U.S. aircraft operating overseas, and the operation of foreign airlines and aircraft in the U.S., means that some significant safety issues will be overlooked because of insufficient qualified staff to respond to accident investigations.

Four fully qualified senior investigators are also needed to enhance the Board's non-catastrophic aviation (2), railroad (1), and highway (1) programs. The lack of qualified senior investigators in the Board's Regional Offices has necessitated that we alter the way we investigate certain non-catastrophic accidents. Approximately 1,000 aviation accidents annually, which should be receiving a detailed on-site investigation, are now performed as "limited" office investigations, which is an investigation focused only on the reported system that malfunctioned, such as a power plant failure. The other facets of the accident, which also may be causing safety problems, receive only a cursory examination with minimal on-site investigation. In addition, because of limited resources, the Board, within the past couple of months, has had to further decrease its non-catastrophic aviation investigation effort by establishing another category of investigation below the limited investigation. Approximately 800 accidents in this category are being investigated by telephone, and only to the depth necessary to determine the probable cause and obtain certain basic statistical data for trend purposes. However, many additional safety improvements could result if more investigative effort could be directed to these accidents.

Aviation Appeal Support: 4 positions

Since 1984, as the FAA has devoted more attention and resources to enforcement of the Federal Aviation Regulations, both appealable certificate and license enforcement actions taken by the FAA, and appeals of those actions to the Safety Board have doubled. As a result, the backlog of pending appeal actions at the Board has continued to grow to its current unacceptable level of approximately 1,000 cases.

One Administrative Law Judge, two attorneys, and one clerical support person, are desperately needed to reduce the serious delay in resolving FAA enforcement actions. Currently, final disposition of an appeal case could take as long as 20 months to complete. The additional staff would allow the Board to reach and maintain a maximum processing time of about 12 months.

In addition to increases in the number of appeals expected as a result of FAA's greatly increased enforcement efforts, it also has become much easier for a pilot to litigate an enforcement action because of the growing number of private attorneys who now are familiar with the appeal process and are available to pilots for legal counsel.

For the reasons cited above, it is expected that incoming cases will reach the 1,500 level by fiscal year 1991. The lack of sufficient Board staff to handle this burgeoning number of appeals in a timely manner threatens the effectiveness of FAA's enforcement efforts. Without more resources, the processing time for these appeals will approach 3 years. Further, because the action taken against an airman is stayed until final disposition of the case, the airman is allowed access to the airspace system as if no action had been taken, possibly posing a serious hazard to the safety of persons and property.

SUMMARY OF
RESOURCE REQUIREMENTS AND
WORKLOAD MEASURES
FY 1989-1991

	FY 1989	FY 1990	FY 1991
Resource Requirements			
Budget Authority ($000)			
Policy and Direction	3,030	3,230	3,610
Accident Investigation	11,640	12,421	13,990
Technology	6,110	6,690	7,930
Safety Programs	2,000	2,140	2,270
Administration	1,570	1,680	1,770
Administrative Law Judges	1,010	1,070	1,370
Total Budget Authority	25,360	27,231	30,940
Outlays ($000)	24,478	27,130	30,606
Full-time Equivalent (FTE) Employment (workyears)			
Policy and Direction	34	34	36
Accident Investigation	152	152	161
Technology	75	77	86
Safety Programs	23	23	23
Administration	30	30	30
Administrative Law Judges	10	10	12
Total Funded FTE Employment	324	326	348
Current OMB Ceiling	324	326	348
Workload Measures:			
Safety Recommendations Issued	411	415	445
Major Accident Investigation Reports	27	28	32
Aviation (Domestic)	8	9	11
Railroad	5	5	6
Highway	5	5	6
Marine	8	8	8
Hazardous Materials/Pipeline	1	1	1
Field and Other Accident Investigation Reports	3,494	3,494	3,750
Aviation (Domestic)	3,142	3,142	3,370
Railroad	156	156	170
Highway	132	132	146
Marine	60	60	60
Hazardous Materials/Pipeline	4	4	4
Foreign Investigation (Aviation)(estimate)	80	80	85
Public Hearings	8	8	9
Safety and Statistical Studies	6	6	6
Rulemaking Reviews	30	30	30
Certificate and License Appeals (Closed)	1,109	1,109	1,350

ALLOCATION OF RESOURCES BY PROGRAM, MODE, FUNCTION, AND LOCATION
FY 1991

Distribution by Program	Prcnt	Staff (FTE)	Cost ($000)
Policy and Direction	10%	36	3,610
Accident Investigation	46%	161	13,990
Technology	25%	86	7,930
Safety Programs	7%	23	2,270
Administration	9%	30	1,770
Administrative Law Judges	3%	12	1,370
TOTAL	100%	348	30,940
Distribution by Transportation Mode			
Aviation	64%	222	19,740
Railroad	12%	42	3,730
Highway	16%	54	4,800
Marine	6%	22	1,960
Pipeline	1%	2	180
Hazardous Materials	2%	6	530
TOTAL	100%	348	30,940
Distribution by Function			
Major Accident Investigations	48%	168	14,940
Field Accident Investigations	32%	113	10,050
Safety Reviews and Studies	7%	23	2,040
Appeals	4%	14	1,240
Administrative Support	9%	30	2,670
TOTAL	100%	348	30,940
Distribution by Location			
Headquarters	71%	247	21,960
Field	29%	101	8,980
TOTAL	100%	348	30,940

SAFETY ACCOMPLISHMENTS

The goal of the Safety Board is to achieve the greatest possible safety benefits from its accident investigation, safety study, and other safety promotion activities. During fiscal year 1989, the Board issued 411 safety recommendations as a result of these activities. Since 1982, 73 percent of Safety Board recommendations have been closed as a result of corrective action taken by recommendation recipients. The following are examples of some of the Board's recent safety accomplishments, resulting either from safety recommendations or other safety promotion efforts.

AVIATION

Boeing 747 Cargo Door Warning System

On February 24, 1989 the forward cargo door of a United Airlines Boeing 747 suddenly separated 100 miles south of Honolulu, killing nine persons. The investigation quickly focused on the latching mechanisms of the cargo door and on the possibility that the cams that hold the door closed were not fully latched.

As a result, the Safety Board issued recommendations to the FAA concerning the modification of the cargo door warning system to include a position sensor for the latch cams. This should ensure that indications of cargo doors not fully latched are accurately transmitted to and received by both the ground and flight crews of Boeing Model 747 airplanes. The FAA has since issued a Notice of Proposed Rulemaking (NPRM) on this proposed action. This investigation is currently ongoing.

DC-10 Hydraulic System Design

As a result of the Safety Board's investigation of the United Airlines DC-10 accident in Sioux City, Iowa, McDonnell Douglas is in the process of preparing hydraulic system enhancements which would prevent the loss of hydraulic fluid in the empennage of the DC-10. In the unlikely event of another catastrophic engine failure, controllability of the airplane could be maintained by isolating sheared or damaged hydraulic tubes in one of the airplanes three hydraulic systems, thus preventing total hydraulic loss.

The enhancements will be provided to the operators in the form of kits that will include parts to complete the modifications. Douglas plans to make the first kits available during April of 1990 and will complete shipments in July of 1990. The Safety Board is also investigating the potential effects of uncontained engine failures on the DC-10 and may, at a later date, provide Safety Recommendations in those areas of concern.

Air Traffic Collision Avoidance

On January 5, 1989, the Department of Transportation announced the issuance of a rule to require commercial air carriers to install traffic alert and collision avoidance systems (TCAS) aboard their aircraft by December 31, 1991. The Safety Board, since 1967, has recommended and supported the development of an airborne collision avoidance system independent of the ground-based ATC system to provide protection in areas not covered by ATC radar and as a backup to controllers in other areas. Recently the Safety Board has learned that the deadline for TCAS installation may be extended to 1992 or 1993. The current law, if amended, would require each carrier to outfit 25 percent of its fleet by the end of 1990 which would permit a large-scale evaluation of TCAS in an operational environment.

In recent years, the Safety Board had issued several recommendations to the FAA for needed improvements in the ATC system. These recommendations, which arose from the investigations of four midair collision accidents between August 1986 and May 1987, specifically addressed the need to provide more positive separation assurance between aircraft operating under instrument flight rules (IFR) and those operating under visual flight rules (VFR). Heretofore, the air traffic controllers communicating with IFR aircraft have been unable to perceive pending conflicts with those VFR aircraft which are not equipped with altitude reporting (Mode C) transponders. The Safety Board had recommended that the FAA impose more stringent requirements on those aircraft which operate under VFR provisions in airspace frequently transited by air carriers. Moreover, the Safety Board noted that the current Automated Radar Terminal System (ARTS) lacked the software logic to provide an alarm to call a controller's attention to a pending conflict involving a VFR Mode C equipped aircraft and recommended such enhancements to the ARTS equipment.

During 1988, the FAA issued a final rule which established a requirement for most aircraft to have an operating transponder with automatic altitude reporting capabilities (Mode C transponder) when operating near certain airports. Of the three major benefits of Mode C transponder equipment, the first is that it permits air traffic control (ATC) radar displays to automatically display altitude. The second major benefit is that computers use the route and altitude information to sound alarms when imminent collision hazards are detected. The third major benefit is that Mode C, in conjunction with other action recommended by the Safety Board since the early 1970s and implemented by the FAA in 1988, will allow airborne TCAS to become practical.

On August 26, 1988, the FAA Administrator, in response to safety recommendations made to the FAA as a result of the Safety Board's investigation of a midair collision involving AeroMexico flight 498, a DC-9-32, and a general aviation Piper PA-28-181, advised the Safety Board of the FAA's intent to add VFR conflict alert (Mode C intruder) logic software to the ARTS IIIA computers. The FAA awarded the contract during the fourth quarter of fiscal year (FY) 1989. Following extensive testing at the FAA Technical Center in Atlantic City, New Jersey, the first field site installation is planned for the third quarter of FY 1991. All terminal ARTS IIIA sites should be operational with Mode C intruder software by the second quarter of FY 1993.

The Safety Board believes that the implementation of Mode C intruder conflict alert capability in the terminal environment, together with new requirements for Mode C equipment use, new designs for terminal control area (TCA) airspace, and the current law for TCAS, will greatly enhance the prevention of midair collisions and near-midair collisions.

Air Traffic Control Procedures

The new edition of the Air Traffic Controllers Handbook, 7110.65F, and the Airman's Information Manual (AIM) that became effective on September 21, 1989, contain recommended changes which make the complete or partial loss of airborne weather radar equipment capability a part of that information which is reported to air traffic controllers and requires that the receipt of this type of information by controllers be passed on to the next controller or air traffic control facility.

The recommendations for these changes resulted from the Board's investigation of an April 1986 accident, which involved a twin-engine, eight-passenger, turbojet airplane, near Redwater, Texas. Specifically, two of these recommendations urged the FAA to make changes to the ATC Handbook and to the Airman's Information Manual to recommend that pilots report complete or partial loss of airborne weather radar equipment to air traffic controllers.

On January 10, 1989, the FAA Administrator advised the Safety Board that draft changes to these manuals had been prepared and were being circulated to user groups and various FAA organizations for comment. The Safety Board believes that the incorporation of these changes to the manuals will enhance in-flight safety for pilots during inclement weather.

Coast TRACON Air Traffic Control Facility

In November 1989, the FAA announced that four air traffic control facilities that exist within southern California, including the Coast TRACON, will be combined and relocated to the Mirimar Naval Air Station, in San Diego. By January 1991, construction will have begun on a new 100,000-square-foot building housing approximately 400 air traffic controllers, technicians and other personnel. In the interim, projects are underway to expand, renovate and rehabilitate the existing facility at Coast TRACON.

This action resulted from a special investigation conducted by the Safety Board of the Coast Terminal Radar Approach Control (TRACON) following an operational error which involved controllers at that air traffic control (ATC) facility. The incident occurred on February 13, 1989. The operational error resulted in the loss of standard air traffic control separation between British Airways flight 282, a Boeing B-747, and American Airlines flight 1262, a British Aerospace 146, when both airplanes passed near the Seal Beach, California, VORTAC at 9,000 feet.

The special investigation identified numerous deficiencies and problems related to air traffic control operations, which included inadequate size and poor physical condition of the operational quarters, inadequate controller staffing, excessive use of overtime, improper airspace design, procedures, and training programs, and an inadequate program for quality assurance and safety oversight of the air traffic control system.

After completing it's special investigation, on May 23, 1989, the Safety Board issued 11 safety recommendations to the FAA.

Crashworthiness of Passenger Seats

During the Safety Board's investigation of the Grand Canyon Airlines de Havilland DHC-6-300, Twin Otter accident on September 27, 1989, serious deficiencies were found with the crashworthiness of the passenger seats. The steel hollow tube seat frames had been chromium (chrome) plated for cosmetic reasons which was not approved by the FAA. As a result of the improper chroming, the Safety Board found multiple seat frame separations at welds that were made during manufacture, and corrosion of hollow steel tube seat frames to the extent that some frame tubes had no wall thickness beneath the chrome plating. Also found, were pre-existing cracks at welds in the lower seatback support frames. As a result of these findings the Safety Board inspected 21 Grand Canyon Airlines and Scenic Airlines (which owned Grand Canyon Airlines) airplanes of the same configuration. This inspection revealed similar corrosion and cracks in those seat frames.

The FAA's Western Pacific Region was notified of the Safety Board's onscene investigation findings and the FAA in a letter of correction to Scenic Airlines on October 5, 1989, stated that prior to further passenger carrying operations, the airlines should inspect all passenger seats to determine if seat frame tubes had reduced wall thickness due to internal corrosion. The Scenic and Grand Canyon airlines compiled with the full intent of the FAA's letter and thereafter ordered newly manufactured seats for their entire fleet.

Foreign Accident Investigations

Because of the growing number of U.S.-manufactured and U.S.-registered airplanes operating overseas, and because of the Safety Board's status as the sole U.S. accredited representative at foreign accident investigations under the provisions of the International Civil Aviation Organization (ICAO), U.S. manufacturers and operators rely heavily upon the Board to facilitate their involvement in the investigation of foreign incidents and accidents. The Board's involvement provides a critical contribution both to U.S. foreign relations and to strengthening the Nation's balance of trade posture through aviation exports. Some examples of the Safety Board's involvement over the past year follows.

Following the loss of Pan American flight 103 over Lockerbie, Scotland, during the Christmas holidays in 1988, the Safety Board dispatched an accredited representative and three other technical experts to Scotland to assist the British investigators in their work. The accredited representative oversaw the activity of the 35 U.S. government and industry technicians who made up a team that spent almost an entire month sifting through the debris. Members of this team were the first to locate aircraft fragments indicative of a terrorist bomb aboard the aircraft. Later, the British and Americans successfully completed the massive task of determining exactly where the bomb was placed in flight 103's cargo hold. The British aviation accident investigator-in-charge stated on several occasions that the work so far could not have been completed without the help of the American contingent.

On January 8, 1989, a British Midland Airways Boeing 737 crashed shortly after takeoff from London's Heathrow Airport, killing 44 persons. Since this was the first survivable crash of a new U.S.-manufactured airplane with newly-developed 16g seats, the Safety Board is devoting special attention to documenting the dynamic crash loads experienced by occupants of the aircraft and identifying injury mechanisms. In addition, because the accident followed a problem with one of the engines, the investigation has focused on the reason for the initial engine problem. The CFM-56 engine is manufactured jointly by the General Electric Company and a French company. The Safety Board has coordinated and participated in extensive corrective actions involving the operation, design, and certification of this model engine since the accident. This investigation and further corrective actions are ongoing.

On February 8, 1989, an Independent Air, Inc. B-707-331B crashed on descent to Santa Maria Island in the Azores, Portugal. All 144 persons on board were killed. Eleven days later, a Flying Tigers B-747-200 struck a hill while on approach to the Kuala Lumpur International Airport, Kuala Lumpur, Malaysia. The flight was operating as a cargo flight. All four persons aboard the airplane were killed. The evidence obtained from the investigations of both accidents indicates that a misunderstanding may have developed in the exchange of communications between the flightcrews and controllers. In both instances, the misunderstanding apparently involved altitude clearances in the terminal area. As a result, the Safety Board issued recommendations to the FAA concerning foreign airport operations and flightcrew training for foreign flight operations.

The Safety Board also assisted the government of Peru in the investigation of the accident of a U.S.-operated Cessna Caravan involved in the drug eradication program in Peru. The airplane crashed in the Andes on May 20, 1989, on a flight from Tingo Maria, Peru, to Lima. At the request of the Peruvian government the Safety Board sent a team of investigators to Peru to examine the wreckage and to obtain information about the operation. The team documented data about the status of the airplane at impact, provided a preliminary factual report to the government of Peru, and worked with U.S. government representatives to improve the level of safety of such operations.

On June 7, 1989, a Surinam Airways DC-8-62 crashed near Paramaribo, Surinam, on a flight from Amesterdam, the Netherlands. Of the 184 persons onboard, 177 were killed in the accident. The airplane, manufactured in the United States, was operated by a United States flightcrew that was supplied by a United States firm to operate the airplane on a contractual basis. The captain was not certificated to operate the airplane in revenue passenger transport in either the United States or in Surinam, but the airline and government aviation regulators were not informed of this fact by the firm supplying the crew.

On September 3, 1989, a VARIG Airlines Boeing 737-200 Advanced crashed in the Brazilian jungle after the pilot had reported encountering navigational problems with the airplane. Eleven passengers were killed in the accident. The Safety Board sent an accredited representative to the investigation, who later found evidence of errors that the crew committed in the conduct of the flight.

More recently, the Safety Board sent accredited representatives and technical specialists to investigations of the UTA DC-10-30 which crashed in the desert over Niger on September 19, 1989, and the Avianca Boeing 727-100 which crashed following takeoff from Bogota, Columbia on November 27, 1989. The Safety Board team helped both investigating authorities determine that explosive devices, which had been placed onboard the airplanes, caused the accident. Over 270 passengers and crew were killed by the saboteurs in the two accidents.

The Safety Board sent an accredited representative to the investigation of the accident that occurred on October 21, 1989, involving a Honduran Boeing 727-200, operated by Tan Sahsa Airlines while on approach to Tegucigalpa, Honduras. Of the 146 passengers and crew onboard, 135 were killed in the accident. The investigation has found crew errors in the conduct of approach.

The Safety Board continues to monitor several other ongoing foreign investigations for any potential safety issues affecting U.S. aviation safety. In addition to on-scene assistance, other considerable efforts are expended by the Board in assisting foreign governments with flight recorder readouts, overseeing engine teardowns or examinations of other components, and gathering pertinent data to assist the Board's counterparts in other countries. Currently the Safety Board is involved in over 60 active foreign cases, many of which have led to safety improvements.

General Aviation Accident Investigations

During the past year the Safety Board investigated more than 2,450 general aviation accidents. The great majority of these were handled by Safety Board investigators in 10 regional offices around the Nation. Although most of these investigations are not as publicly visible as those involving major air carriers, they do have a significant impact on transportation safety.

For example, on February 25, 1989, a Piper PA-18 Super Cub experienced an in-flight separation of the left wing near Jacksonville, Arkansas. The pilot and one passenger were killed and the airplane was destroyed. The Safety Board's investigation of the accident revealed that the forward lift strut of the left wing had separated near its lower end in an area of internal corrosion. On August 29, 1989, a Piper PA-22 Tri Pacer experienced an in-flight separation of the right wing at Moose Lake, Minnesota. The flight instructor and second pilot suffered fatal injuries, and the aircraft was destroyed. The Safety Board's investigation revealed internal corrosion of the forward lift strut of the right wing at the separation near its lower end. The Piper Aircraft Corporation (Piper) has manufactured 15 models of airplanes that incorporate tubular steel wing lift struts. Currently, about 20,000 of these airplanes are in service. Piper has revised its strut inspection schedule to reduce the 5-year cycle of recurrent internal corrosion inspection. The FAA recently issued an Airworthiness Directive to require these annual inspections.

On January 30, 1989, Textron Lycoming issued a Service Bulletin requiring an initial and repetitive inspection of the Lycoming TIO-540-S1AD engine exhaust systems installed on some Piper airplanes followed by modifications to the exhaust system at overhaul. This action was taken following the Safety Board's recommendation to the FAA that they require Piper Aircraft Corporation to conduct a design review of the exhaust systems in these airplanes in connection with the assembly, installation, and integrity of the left intermediate exhaust pipe. Approximately 4,200 aircraft will be affected by this action, which resulted from an investigation of a Piper PA-32R-300T aircraft accident in Lincoln, Nebraska. On the accident flight, the airplane departed the Lincoln Municipal Airport and was climbing to cruise altitude when smoke originating from the engine exhaust system began filling the cabin. Shortly thereafter, the engine stopped and the airplane crashed and burst into flames as the pilot attempted an emergency landing. The fire killed the pilot and front-seat passenger and caused second- and third-degree burns to the rear-seat passenger who was able to escape.

In addition, in response to a Safety Board recommendation, the FAA issued an airworthiness directive (AD) requiring inspection, rigging, repairs, and modification of the forward baggage compartment door on certain Piper PA-34 models. In addition, Piper Aircraft Corporation issued a Service Bulletin requiring a design improvement to provide a reliable locking mechanism for the baggage compartment door. These actions were taken following the review of 10 Piper PA-34 series accidents/incidents reported to the Safety Board. The Board's investigation revealed the nose compartment baggage door inadvertently opened in flight due to an improper latching mechanism. Approximately 2,200 Piper PA-34 aircraft were affected by the AD and Service Bulletin.

Boeing 737 Cone Bolt Separations

As a result of the Board's investigation and recommendations stemming from two similar accidents involving in-flight engine separation, the FAA issued an airworthiness directive requiring recurrent inspections of the aft cone bolt, which attaches the rear of the engine to the wing, for evidence of cracking. The first of these accidents occurred on December 5, 1987, when a USAir B-737 engine separated in flight near Philadelphia, Pennsylvania. On January 20, 1989, the right engine separated from the wing of a Boeing 737 operated as Piedmont flight 1480, as the airplane lifted off the runway at Chicago's O'Hare International Airport. Although the engine separations caused no injuries in either the Philadelphia or Chicago incidents, the potential for injuries was substantial. As a result of recommendations by the Safety Board following the Chicago incident, the frequency of the aft cone bolt inspections were increased and a newly designed fail-safe support was required to be installed within 4,000 operating hours. Further, the probable source of the cracking problem, namely the loss of pre-torque on these bolts, is required to be checked until the torque stabilizes to an acceptable level. These actions should preclude further occurrences of engine separation which could result in major accidents of B-737 aircraft.

Inadequate Runway Markings

The Safety Board conducted an investigation of Houston's Hobby Airport following two incidents of pilot deviations that involved departures of two air carrier airplanes from the wrong runway. Both flights inadvertently departed from runway 17, although runway 12R was the runway from which both flights were cleared for takeoff. Both airplanes struck barriers approximately 3,800 feet down runway 17 and sustained minor damage.

Although there were no injuries to anyone on the airplanes or on the ground, the Safety Board was concerned that both incidents had the potential to become catastrophic accidents with loss of life. As a result, the Safety Board issued an urgent safety recommendation to the FAA to take immediate corrective action, in conjunction with the airport authority, to prevent inadvertent takeoffs by air carrier airplanes. In response to the Board's recommendation, the airport authority improved the runway markings at the approach ends of runways 12R and 17. Additionally, the FAA enacted improved air traffic control procedures to preclude future inadvertent takeoffs.

Fairchild/Swearingen SA-226/227 Nose Wheel Steering Problems

As a result of two Safety Board accident investigations, the FAA issued an aviation standards special notice concerning Fairchild/Swearingen SA-226/227 nose wheel steering, and Skywest Airlines and Horizon Air changed their maintenance procedures on the nose wheel steering system of their SA-226/227 aircraft. In addition, Fairchild/Swearingen issued a service bulletin on this subject and is currently evaluating a new nose wheel steering system for incorporation as a product improvement. These changes affected approximately 416 SA-226 aircraft and 308 SA-227 aircraft. The Safety Board investigated two occurrences in which the flightcrew experienced an uncommanded input to the nose wheel steering that they were unable to correct. The first incident involved a SA-227 on January 23, 1989 operated by Horizon Air. The aircraft swerved off the runway at Seattle Tacoma International Airport, Seattle, Washington, while on takeoff roll. The aircraft sustained minor damage and there were no injuries to the crew or passengers. The second occurrence involved a SA-226, operated by Skywest Airlines, that crashed on takeoff roll from Saint George Airport, Saint George, Utah. The aircraft departed the left side of the runway after commencing its takeoff roll and collided with a parked aircraft and truck. There were no injuries to the crew or passengers; the aircraft sustained substantial damage. Further investigation following these accidents, revealed that nose wheel steering abnormalities have plagued the SA-226/227 fleet since 1970. Several airworthiness directives and other documents have been issued since 1970 to address the problems; however, until now, none have provided corrective measures.

Aerospatiale AS-355 Tail Rotor Driveshaft

As a result of a Safety Board investigation, Aerospatiale issued a telex service bulletin in November 1988 establishing an inspection program to monitor the vibration levels on the main gearbox oil cooling fans of the AS-355 series aircraft. The FAA subsequently issued an airworthiness directive (AD) requiring the inspection. The service bulletin and AD affected about 390 Aerospatiale AS-355 series aircraft. Aerospatiale designed a totally new driveshaft, and the fleet retrofit program was completed in January 1989. The investigation that initiated this change involved an Aerospatiale AS-355F-1 that crashed into the Gulf of Mexico following a loss of control on takeoff from an oil production platform. The investigation revealed that the loss of control occurred as a result of a fatigue failure of the tail rotor driveshaft in the area of the forward flange coupling.

Use of the National Driver Register

On May 18, 1989, the FAA published a Notice of Proposed Rulemaking (NPRM) which would establish rules under which two or more alcohol or drug-related motor vehicle convictions or related State administrative actions would be grounds for certificate action against a pilot. The NPRM also proposed to add a consent provision to facilitate FAA access to the National Driver Register (NDR).

This action by the FAA is the culmination of an effort by the Safety Board, which began over 5 years ago, to persuade the FAA to seek legislation that would give it the authority to make use of the NDR to identify airmen with convictions for operating a motor vehicle while under the influence of alcohol or drugs. The NDR Act of 1982 was amended to give the FAA this authority in December 1988, and the legislation containing the amendment was signed into law by the President on December 30, 1988.

Fatigue in Pratt & Whitney Engine Turbine Blades

During the past year, the Pratt & Whitney Corporation has redesigned the high-pressure turbine rotating airseals in its engines. Subsequently, the FAA issued an airworthiness directive requiring the incorporation of the new designs. It has been determined that since the implementation of the airworthiness directive all affected Pratt & Whitney JT9D-7R4 model engines have been modified in accordance with the service bulletin, and that no additional failures have been experienced. Therefore, it is believed that this airworthiness problem has been resolved. The engines power certain models of such commonly flown widebody aircraft as the Boeing 747, Boeing 767, and Airbus Industries A-310.

These changes were instituted because of a Safety Board recommendation, emanating from the July 2, 1986, accident of an Airbus Industries A-310, operated by Pan American World Airways flying from Hamburg, West Germany. At the time the recommendation was issued, the Safety Board was aware of at least two other similar incidents. With further investigation, the FAA found 11 reported events of fractured/cracked airseals.

Runway Grooving

On July 18, 1989, a United Airlines DC-10 hydroplaned on landing rollout at Chicago's O'Hare Airport. The Safety Board's investigation revealed runway grooving in the mainmount track area was worn and depressed to the point that pools of water collected. As a result, the FAA issued a Notice to Airmen (NOTAM) on July 26, 1989, changing the runway composition from grooved to non-grooved and cautioned pilots of standing water on the runway following rainstorms. In addition, United Airlines and American Airlines issued notices to their air crews warning of adverse runway conditions during periods of precipitation. Emergency re-grooving was completed in early fall 1989 and the runway will be resurfaced in the spring of 1990.

Augusta 109 Main Rotor Blade Failure

On October 10, 1989, an Augusta 109 helicopter experienced an inflight separation of one of its four main rotor blades, causing the complete separation of the transmission and rotor system. The helicopter fell, out of control, from an altitude of 2,200 feet into a wooded area killing all five occupants. The Safety Board's metallurgical examination of the fracture surface on the rotor blade revealed a fatigue crack and gouge (scratch) on the inner surface of the lower leg of the blade spar. An Airworthiness Directive (AD) was issued to reduce the service life of the main rotor blade and require an initial inspection and subsequent recurring inspection for cracks on the lower surface of the main rotor blade. This AD will affect all Augusta helicopters located in the United States.

Bell 206L Hydraulic Shaft

On September 5, 1989, the pilot of a Bell 206L helicopter reported that approximately 15 minutes into an aerial search flight, the low rotor RPM light and horn came on. The rotor tach needle fell to zero with the engine tach needle at 100 percent. The pilot elected to land in a shopping center parking lot. Approximately 30 seconds after the initial failure, a complete hydraulic failure was experienced. He performed the hydraulic failure emergency procedure to no avail. Investigation of the incident revealed that the shaft, which allows the transmission to drive the rotor tachometer, which in turn drives the hydraulic pump, was worn and would no longer engage the output shaft from the transmission. The pump provides an hydraulic boost to the helicopter's flight controls. Additional occurrences were found during an examination of the computer run of Service Difficulty Reports. As a result of this investigation, Bell Helicopter implemented a revision to the 206L and 206B helicopter maintenance manuals calling for a 300 hour periodic scheduled lubrication and inspection of the wear of the hydraulic shaft. The revision for the 206L will be effective by the end of 1989 followed by the revision for the 206B models in January 1990.

RAILROAD

Railroad Event Recorders

On August 4, 1989, the Congress introduced the Railroad Event Recorder Act of 1989 to mandate event recorders on all locomotives. This legislation, if enacted, will direct the Secretary of Transportation to take immediate regulatory action to require the installation of event recorders within a specified time period.

The Federal Railroad Administration (FRA) issued an advance notice of proposed rulemaking (ANPRM) on November 23, 1988, in response to the Railway Safety Act of 1988, to determine if Federal regulations are required to establish standards for event recorders. The Safety Board responded fully to the FRA's ANPRM, not only urging the FRA to implement technical standards regarding event recorders, but also to require recorders on all locomotive units. Both current and past Safety Board investigations have been hampered by lack of railroad event recorders. Recorders on either of the two "helper" units involved in the May 1989 San Bernardino, California, accident would have helped answer a critical question regarding the braking capabilities of the accident train. In addition, critical data were not available because of the lack of proper event recording in the Freeland, Michigan, railroad accident on July 23, 1989. The FRA has reviewed industry comments to the ANPRM but has not yet issued further rulemaking.

Emergency Exit Marking on Passenger Trains

During the past year, Amtrak completed the installation of signs in railway passenger cars which identify emergency exits and their function. Amtrak has also installed the universally-recognized handicapped placard on interior doors and on the exterior of cars that have handicapped compartments. Finally, Amtrak is completing the installation of emergency exit windows in all sleeper car compartments. Since Amtrak carries the majority of U.S. rail passengers (excluding rail rapid transit), the installation of the emergency exit signs constitutes a major safety improvement by facilitating quick egress in emergency situations.

This change came about as a result of a safety recommendation emanating from investigations into accidents such as the August 5, 1988, derailment of Amtrak's "Empire Builder" at Saco, Montana, during which 105 passengers and crew were injured. Following the accident, rescue personnel encountered several problems while trying to enter the rail cars and extricate injured persons. For example, an 84-year old woman was trapped inside a sleeper car's specially equipped compartment for handicapped passengers. The Safety Board's investigation found that the handicapped designated compartments were not identified to assist rescuers in locating persons who may not be able to escape unaided following an accident, that the sleeper car windows were not provided with handles that could be used to remove the windows, and that windows that were designated as emergency exits had no operating instructions on the inside and outside of the cars.

NYCTA Improvements

During the past year, several significant safety improvements for passengers riding within the New York City Transit Authority (NYCTA) system were implemented. In the years 1985 and 1986, the Safety Board focused its investigations on several wide-ranging problems with the NYCTA resulting in the issuance of a number of safety recommendations.

In response to the Board's recommendations, the NYCTA developed firm procedures to limit train lengths, thereby reducing the strain put on working motor control groups. The 1985 Safety Board study noted that such practices could have led to the approximately 242 working motor control group fires within the New York subway system during 1984. These fires endanger passengers and employees and have caused severe damage to NYCTA cars. In many incidents the fires burned through the floors of subway cars and entered passenger compartments.

As a result of an NYCTA train derailment resulting from an improper replacement of trackage, the Safety Board, in May 1985, issued a recommendation regarding deficient staffing, training, procedures, inspection, and supervision within the NYCTA. As a result, the NYCTA has implemented a number of changes, including a maintenance supervisor training program. Additionally, at bi-annual reviews, managers are required to document goals and results which show where deficient training and supervision exist. This is a result of the NYCTA's use of the "Hay Managerial Evaluation System." Further, the NYCTA has vastly expanded the breadth and scope of its curriculum by adding and developing a number of other supervisory and management courses. These actions combine to benefit safety by teaching managers and supervisors to objectively show deficiencies and negative trends, such as those found by the Safety Board, allowing corrections to be made before hazardous situations occur.

Also as a result of the above derailment, the Safety Board found that the No. 7 wheel, the lead wheel on the right side of the second car, had a flat surface on the flange. This condition gave it greater opportunity to strike and go over the switch point where the derailment initiated. Due to the condition of the tracks, a derailment would have eventually occurred. However, the possibility existed that this particular car would have followed the first car through the switch if the flat spot had not been present. The NYCTA adopted the resulting recommendation that it establish a standard for determining the wear limit for the top of a wheel flange to prevent continuation of service with wheels exhibiting flange flat spots.

Backup Devices on Conrail Locomotives

During the past year, Conrail made considerable progress in expediting its program to install automatic safety backup devices on its fleet of locomotives. In addition to completing its program for adding an automatic stop feature to the cab signal devices on its 1416 series road freight locomotives, Conrail replaced the air signal whistle with an electronic device which is not subject to being muffled or otherwise nullified.

Conrail's effort to enhance railroad safety was the result of the Safety Board's investigation of the rear-end collision of an Amtrak passenger train and a Conrail train on the Northeast Corridor at Chase, Maryland, on January 4, 1987.

Employee Assistance Programs for Substance Abuse

During the past year, the Association of American Railroads (AAR) encouraged its members to inform all employees of the availability and capabilities of their employee assistance programs (EAP) on an ongoing basis. This official AAR notification, resulting from the Safety Board's study entitled, "Alcohol/Drug Use and its Impact on Railroad Safety," will ensure that all railroad employees are informed of the nature and availability of EAP services, especially the assistance available in dealing with substance abuse. The Board's study found that there was considerable variation among the railroads as to the availability and distribution of EAP information.

Amtrak Passenger Car Safety

As a result of the Safety Board's investigation into an Amtrak accident in Hastings, Nebraska, in February 1988, Amtrak made a number of changes to its passenger car fleet to enhance safety. The accident train, with 309 persons on board, was making a station stop at Hastings when fire was discovered in a coach/dormitory car. The occupants of the coach/dormitory car and an adjoining sleeping car were evacuated. As a result of the smoke and fire, one Amtrak employee died, and nine others were hospitalized for smoke inhalation and observation. The Board's investigation revealed a short circuit in the wiring to the floor level baseboard heater element in the baggage compartment of the coach/dormitory car. In addition, substandard wiring supports, wire bundling, and substandard current-carrying conductors were found. Further exacerbating the situation, the evacuation was hampered by faded and illegible instructions for opening the emergency windows.

Changes made by Amtrak in response to the Board's findings included the following. A new method of marking and removal of emergency windows was implemented and cars were recently equipped with smoke detectors. Guards are being placed over the battery operated smoke detector units to prevent unauthorized removal. In addition, smoke detectors requiring 110 AC power are being installed as a replacement for the battery operated units to prevent pilferage for home use.

Electric heaters on all 39000 series cars were disconnected and are undergoing overhaul. The conductors feeding the car heat elements have been placed in metallic conduits to prevent mechanical damage to insulation. As a precautionary measure, temperature sensitive switches have been installed on the resistive heater element housings to eliminate potential fires caused by strip heaters.

Bottom Shelf Couplers

During the past year the Association of American Railroads (AAR) revised its interchange rules, allowing railroads to replace standard couplers with bottom shelf couplers. This significant safety improvement action will mitigate the effects of derailments by limiting outward excursion of derailed freight cars, and by lessening the potential for side punctures of tank cars. The derailment of a St. Louis Southwestern Railway Co. freight train with accompanying releases of hazardous materials at Pine Bluff, Arkansas, on June 9, 1985, led to the evacuation of the surrounding community. Damages from this accident were in excess of $4 million. As a result of the investigation of this accident, the Safety Board recommended that the AAR require that coupler replacements on freight cars be of the bottom shelf configuration. Until that time, the AAR's rules governing the interchange of rail equipment stipulated that coupler replacements would be made in kind. The substitution of a different coupler would result in a financial penalty for a railroad performing repairs on a railcar owned by another railroad. The AAR had presented the Board's safety recommendation to its Coupler and Draft Gear Committee in January 1987 in a special letter ballot.

Hours of Service -- Work/Rest Cycles -- Fatigue

Based on its experience in several transportation accident investigations, the Safety Board issued three safety recommendations to the Department of Transportation in May 1989, urging that it initiate an aggressive Federal program to address the problems of fatigue and sleep issues in transportation safety. The recommendations advocate a coordinated research effort on the effects of fatigue, sleepiness, sleep disorders, and circadian factors on transportation system safety; an extensive educational effort directed toward all segments of the transportation industry; and a systematic review and improvement of regulations governing hours of service across all transportation modes. In August 1989, the Secretary's response outlined both modal administration and Departmental actions under way or planned concerning these issues. The Safety Board has classified these recommendations as "Open - Acceptable Action", but will continue to monitor closely the progress made.

In February 1988, as a result of its investigation of the derailment of an Amtrak passenger train at Fall River, Wisconsin, the Safety Board recommended that the FRA make certain changes in its hours-of-service regulations. These changes would provide for mandatory lunch breaks and off-duty periods for train dispatchers and operators, and would determine workload limits for train dispatchers. In response to the recommendations, the FRA indicated that the number of hours railroad employees may work is controlled by the provisions of the Hours-of-Service Act, which the FRA enforces but has no authority to alter. The FRA will, however, "continue to take the position that Congressional oversight of the Act is in order."

Hours of service and workload issues surfaced again in the Safety Board's investigation of the collision of two Conrail freight trains near Thompsontown, Pennsylvania, on January 14, 1988, and in the investigation of the collision of two Iowa Interstate Railroad freight trains at Altoona, Iowa, on July 30, 1988. Consolidation of dispatching districts and redefinition of divisional assignments for train crews by the railroad industry causes the Safety Board to be concerned that these safety issues will become more prevalent than in the past.

The human performance issues present in these train accidents are not unique to the railroad industry. They have frequently appeared in accidents in the highway, marine, and aviation modes as well.

HIGHWAY

Rear Seat Lap/Shoulder Belts

In June 1989, the National Highway Traffic Safety Administration (NHTSA) issued a final rule requiring rear-seat lap/shoulder belts in cars, manufactured after December 11, 1989. Prior to this, all domestic manufacturers announced their intention to provide rear-seat lap/shoulder belts in new cars. This requirement was extended to light trucks, multipurpose vehicles, and convertibles for vehicles manufactured after September 1, 1991. Within a few years, virtually all new domestic and many foreign models will provide three-point lap/shoulder belts in rear outboard seating positions as standard equipment. Furthermore, under continued pressure from the Safety Board and the Congress, all domestic car makers and most foreign manufacturers have developed retrofit programs to make rear-seat lap/shoulder belts available to owners of many pre-1987 vehicles. Research is also underway to determine the feasibility of installing lap/shoulder belts at the centermost seating position; all occupants would then be afforded upper torso restraint.

These actions resulted from Safety Board recommendations that lap/shoulder belts be installed at all outboard seating positions and that manufacturers develop an aggressive program to install lap/shoulder belt retrofit kits in existing models. The recommendations were originally made in a Safety Board report in August 1986 on the performance of lap-only belts in 26 passenger car accidents (mainly frontal collisions). The Board's report concluded that lap belts provide a significantly lower level of protection than lap/shoulder belts and, in the crashes investigated, sometimes induced serious or fatal injuries that probably would not have occurred otherwise.

The NHTSA, in July 1984, estimated that front-seat lap/shoulder belts were 28 percent more effective in preventing fatalities than lap-only belts. Other researchers believe the difference is even greater. Very few researchers have attempted estimates of rear-seat belt effectiveness since data up to now have been so scanty. few occupants sit in the rear-seat and fewer still are restrained (more are now restrained with the advent of mandatory seatbelt use laws). In March 1987, the NHTSA estimated that rear-seat lap/shoulder belts are 33 percent effective in preventing fatalities while lap-only belts are 26 percent effective. This lap belt effectiveness estimate in particular is much higher than that derived by other studies. A GM researcher, for example, in 1988 placed the fatality effectiveness of a lap-only belt to be 18.9 percent, and estimated that almost all of that crash protection comes from ejection prevention; a lap-only belt provides little or no protection against injurious interior impacts. This is not the case with a lap/shoulder belt, which not only provides protection against ejection, but substantial protection against harmful contact with the vehicle interior.

Increased Awareness of the Dangers of Lap/Shoulder Belt Misuse

Public awareness has been raised of the need, not only to wear the available lap/shoulder belts, but to wear them properly. A Safety Board study, "Crash Performance of Lap/Shoulder Belts in 167 Motor Vehicle Crashes," issued in 1988, documented the fine performance of properly worn lap/shoulder belts, but also highlighted the degraded crash protection possible if the belt was worn improperly. Cases in the Board's study documented the consequences, sometimes fatal, of improper use of lap/shoulder belts. The ability of slack in the shoulder harness to degrade crash protection received particular attention, in the study, which also focused on the inherent design deficiencies of belts equipped with the windowshade feature. Many car manufacturers are no longer installing lap/shoulder belts with this feature.

Children, as well as adults, have benefited from the Board's findings. Prior to the release of the lap/shoulder belt study, parents were routinely advised by safety organizations and the NHTSA to misroute the shoulder portion of the three-point belt around the child's body if, in the parent's opinion, the shoulder strap came too close to the child's face or neck. Children were thus restrained by a lap-only belt, with its degraded crash protection and potential for lapbelt-induced injuries. Following the release of the study and the publicity on the dangers of misuse and the lack of evidence that a lap/shoulder belt can harm a short person, many associations have softened their stance, now advocating that parents use the lap/shoulder belt as designed. More children thus receive superior crash protection.

School Bus Crash Performance

On April 1, 1977, in response to a congressional mandate, a series of new and amended Federal Motor Vehicle Safety Standards for school buses went into effect. Post-1977 ("poststandard") school buses have greater body joint strength, roof rollover protection, radically redesigned energy-absorbing seats, and emergency egress and fuel system improvements. (The Safety Board documented the fine crash performance of poststandard large school buses in a safety study issued in 1987.)

Poststandard school buses have been gradually replacing prestandard buses in the public school bus fleet. In 1984, according to an industry-wide survey, public school buses were retired, on the average, after 10-12 years of use.

However, as of January 1989, 17 percent (about 60,000) of the school buses used to transport students at public expense are prestandard buses. Probably a higher percentage of the buses in use by private schools, churches, day camps, and other private groups are prestandard school buses.

The Board's 1987 school bus study urged that, instead of installation of passenger lap belts, rapid retirement of any prestandard school buses in the fleet and replacement by poststandard school buses should be a top priority. The safety study further found that there seemed to be no overall safety benefits of passenger lap belts on large poststandard school buses, either in terms of injury reduction or belt use habit formation. As a result, the Board urged States and school districts not to allocate funds for this purpose. Potentially, millions of taxpayer dollars would have been spent outfitting school buses with passenger lap belts had the Safety Board not conducted this study.

The NHTSA concurred with the Board's findings, as did school bus manufacturers, school transportation contractors, the National Association of Pupil Transportation, State Directors of Pupil Transportation, and the National School Bus Minimum Standards Conference. Federal rulemaking connected with the school bus/lap belt question was halted and bills introduced in State legislatures to mandate passenger lap belts on new school buses were defeated. (New York remains the only State to have such legislation.) Some school districts who had pilot projects underway to install lap belts cancelled the projects.

Several States also introduced legislation to set a mandatory retirement age for school buses in use in their State. The need to set retirement of prestandard school buses as a top priority, in terms of improving student schoolbus safety, was emphasized by the Safety Board's report on the Carrollton, Kentucky, church bus crash and fire. As a result of this investigation, the Safety Board formally requested States to set, legislatively, a date by which prestandard school buses would be phased out of service for passenger transportation.

A school bus study funded by Congress, and conducted by the National Transportation Research Board, has reaffirmed the lack of safety payoff for passenger lap belt installation (a $40 million investment for the possible savings of one life annually) and once more called for the expenditure of funds to retire prestandard school buses. Finally, the 1989 edition of the Yellow School Bus Book (the official used school bus market guide) reports that, due to the Safety Board's reports, "school districts are cycling their pre-1977 units early;" furthermore, early replacement has driven the average age of school buses "from some 10 years to some 8 years currently."

The end result is that school children have a better chance of riding in a modern school bus, with its improved crash protection, than before, and money, when spent to improve school bus safety, will be spent on measures more apt than passenger lapbelts to result in significant safety benefits.

Elimination of Commercial Zone Exemptions for Commercial Drivers

On May 13, 1988, the U.S. Department of transportation announced a final rule ending a long-standing commercial zone exemption from most of the Federal Motor Carrier Safety Regulations (FMCSR) granted to commercial vehicles and drivers by the Interstate Commerce Commission more than 50 years ago. The final rule requires that interstate truck traffic operating in and around our major cities comply with the same comprehensive Federal safety regulations as do long-haul interstate carriers. A commercial zone is defined as the area in and around any metropolitan district, which includes thousands of town and cities across the nation as well as America's major metropolitan areas.

The Board's recommendation, which prompted this rulemaking, grew out of its safety study on the training, licensing and qualification standards for drivers of heavy trucks. The Board recommended that the DOT eliminate the exemption from Part 391 of the FMCSR granted to commercial drivers who work exclusively within a single city or commercial zone.

Securing Double Combination Trailers

The Director of Safety for the Washington Trucking Association ordered the publication of an article prepared by a Safety Board investigator encouraging owners and fleet operators to check their trailers for inadequate connection of the drawbar. This resulted from the Safety Board's July 27, 1988 investigation involving a collision between a Kenworth tractor towing a loaded 44-foot lowboy trailer and a Peterbilt tractor with two empty 20-foot trailers. Both combinations were traveling toward each other on a fairly straight section of roadway. A witness reported that the rear trailer of the Peterbilt combination crossed over the centerline and was struck by the oncoming Kenworth, killing the driver. The investigation revealed that the left side of the drawbar on the rear trailer of the double combination came loose, allowing the lateral movement of the trailer.

MARINE

Emergency Position Indicating Radio Beacons for Uninspected Vessels

On October 28, 1988, the U.S. Congress passed Public Law 100-540 which requires each manned uninspected vessel operating on the high seas or beyond 3 nautical miles from the coastline of the Great Lakes to be equipped with the number and type of alerting equipment, including emergency position indicating radio beacons (EPIRBs), prescribed by the U.S. Department of Transportation. The Safety Board's accident investigation findings provided the factual basis needed to support this legislative action.

In 1986, the Safety Board recognized the need for requiring uninspected vessels to carry EPIRBs when it investigated the capsizing and sinking of a large oceangoing uninspected sailing vessel, owned and operated by the state of Maryland for goodwill missions around the world. Survivors were not located until 4 days after the vessel sank. Had the vessel been equipped with a Coast Guard approved EPIRB, the survivors would have been found quicker during the massive air and sea rescue that followed the sinking. As a result of this accident, the Safety Board recommended that the Coast Guard seek authority to require all uninspected vessels on voyages offshore to carry class A EPIRBs. On September 15, 1988, the U.S. small passenger vessel COUGAR sank in the Pacific Ocean offshore from Depoe Bay, Oregon; resulting in the loss of four passengers and one crewmember. This vessel was operating as an uninspected vessel and the Board recommended, as a result of this accident, satellite EPIRBs be required within 3 years.

Lifesaving Equipment Improvements

On April 21, 1989, the Coast Guard issued a notice of proposed rulemaking (NPRM) which contains requirements for many long-awaited improvements in lifesaving equipment. For many years, the Safety Board has supported improvements in lifesaving equipment such as retrofitting gravity lifeboat davits on all cargo vessels in ocean, coastwise, and Great Lakes service (which the NPRM will require by July 1, 1991) and retrofitting completely covered lifeboats on tankships certificated to carry crude, product, chemicals, or liquefied gases (by July 1, 2001). The Safety Board has attempted for many years to convince the Coast Guard that primary lifesaving equipment should not have grandfather rights because it sets up two standards of safety. The Board issued a safety recommendation for retrofitting gravity davits almost 10 years ago and for retrofitting covered lifeboats almost 12 years ago.

Since 1984, the Safety Board has investigated four small passenger vessel accidents involving one collision, one fire, one capsizing, and one grounding. In each case it was determined that the Coast Guard survival craft requirements were inadequate. The four small passenger vessels, together, carried more than 290 persons. In each of the accidents, the Safety Board expressed concern to the Coast Guard about the use of buoyant apparatus and life floats aboard small passenger vessels in lieu of liferafts. Neither buoyant apparatus nor life floats are capable of protecting persons from immersion in the water, and hypothermia can result. In addition, the Safety Board is concerned that the Coast Guard does not require that small passenger vessels carry survival craft sufficient to provide out-of-the-water support for 100 percent of the persons on board and that antiquated survival equipment that does not provide this protection is still being allowed on small passenger vessels.

Pilotage

Action taken by the Coast Guard during the past year to improve its oversight of State pilots represents positive steps toward correcting shortcomings in the Coast Guard's marine safety authority. As a result of its investigation of the collision between the Hong Kong bulk carrier

PETERSFIELD and a tow of eight tank barges in the Mississippi River in 1986, the Safety Board recommended that the Coast Guard seek legislation to require that all pilots of commercial vessels on the navigable waters of the United States have a Federal pilot's license which would be legally superior to all State-issued documents, licenses, or commissions. This recommendation was deemed necessary because State pilots, who regularly operate oceangoing vessels on Federal waters are not currently accountable to Federal authorities for acts of misconduct or negligence, and State authorities are sometimes lax in exercising remedial action in such cases. The Safety Board maintains that this lack of Federal authority to control State pilots prevents the Coast Guard from carrying out its congressional mandate to ensure safety on Federal waterways. The Coast Guard Commandant concurred with the Safety Board's position, stating that the Coast Guard recognized the need for establishing better disciplinary control over State pilots, and intended to conduct a study of marine casualties over the past several years to determine the extent of pilot-related accidents and their impact on marine safety to enhance the possibility of gaining congressional support.

As a result of its investigation of the ramming of the Sidney Lanier Bridge in Brunswick, Georgia, by the Polish bulk carrier ZIEMIA BIALOSTOCKA while under the navigational control of a U.S. pilot, the Board recommended that the Coast Guard require that all applicants for pilot's licenses pass an examination on the vessel maneuvering data that commonly is provided to pilots when they board vessels. In its October 1988 response, the Coast Guard agreed to revise the pilot examination requirements to make applicants for original pilot's licenses subject to examination on technical parameters affecting vessel maneuvering and on the maneuvering information provided to pilots when they board vessels.

Inspection and Certification of Small Passenger Vessels

On January 30, 1989, the Coast Guard published a notice of proposed rulemaking (NPRM) to revise the regulations governing the inspection and certification of small passenger vessels which will significantly increase the safety of small passenger vessel operations in the United States. The proposed regulations address many of the Board's longstanding concerns regarding the inadequacy of Federal safety regulations applicable to U.S. small passenger vessels. In part, this NPRM proposed:

-- that small passenger vessels be required to carry one child-size life preserver for each child of less than 90 pounds body weight. The Safety Board had recommended this action as a result of its investigation of the capsizing of the U.S. small passenger vessel SAN MATEO in Morro Bay, California, on February 16, 1983, which resulted in 23 school children being thrown into the sea;

-- that "a general marine radar system for surface navigation with a radar screen mounted at the operating station" be fitted on certain specified small passenger vessels. The Safety Board issued a series of safety recommendations concerning the need for radar, and in some cases gyrostabilized radar, on large and small passenger vessels, as a result of its investigation of the collision between the U.S.

passenger vessel YANKEE and the Liberian freighter HARBEL TAPPER in 1983, the grounding of the U.S. passenger vessel PILGRIM BELLE in 1985, and the collision between the U.S. passenger vessels JACK W and JAMEY DOWNEY in 1987;

-- that a fire extinguishing system be required on small passenger vessels in all spaces containing propulsion machinery. The Safety Board had recommended that a fixed firefighting system be required in the engineroom (without regard to the type of fuel used for propulsion) of all passenger vessels with accommodations for 50 or more overnight passengers; and

-- that certain passenger vessels be equipped with a public address system operable from the vessel operating station. As a result of its investigation of the collision between the U.S. passenger vessel YANKEE and the Liberian freighter HARBEL TAPPER in 1983, the Safety Board recommended that passenger vessels with more than one passenger deck be required to have an adequate loudspeaker system suitable for announcing passenger advisories, instructions, and emergency alerts from the navigation bridge.

The Safety Board believes that these new requirements will significantly improve the safety of small passenger vessels.

As the result of a recent Safety Board investigation of the sinking of a small passenger vessel in which four people died, the Board learned that if a vessel has a route on its Certificate of Inspection for less than 20 miles offshore, it is not required to carry an EPIRB. It was determined that if this vessel had carried an EPIRB: the size, scope, and expense of the search effort could have been significantly reduced and additional lives may have been saved. The Safety Board has since recommended to the Coast Guard that passenger vessels on coastwise (less than 20 miles offshore) routes be required to carry an EPIRB.

Vessel Traffic Improvements

As a result of a recommendation issued by the Safety Board following a collision between the U.S. Coast Guard Cutter BLACKTHORN and the U.S. tankship CAPRICORN in Tampa Bay, Florida, the Coast Guard conducted a comprehensive assessment of the ship traffic in Tampa Bay. The recently completed study was initiated to determine the need for a Vessel Traffic Service (VTS) in the Tampa Bay area in the wake of the tragic accident that claimed the lives of 23 Coast Guardsmen when the BLACKTHORN sank. Although, a VTS was not established in Tampa Bay, other changes were made to enhance the safety of ship traffic in the harbor.

As a result of an accident involving the ramming of the Maltese bulk carrier MONTFORT by the British tankship MARESK NEPTUNE in Upper New York Bay, the Safety Board, in November 1988, recommended that the U.S. Department of Transportation reestablish the New York VTS. The Congress responded to this recommendation by reestablishing the New York VTS in Public Law 101-45 with its reopening scheduled for late 1990.

Manning Requirements on Small Passenger Vessels

During the past year, the Coast Guard Marine Inspection Office in San Diego, California, reviewed the manning requirements of the certificates of inspection (COI) issued to all small passenger vessels certificated in the San Diego marine inspection zone. Any certificate that did not clearly state the manning requirements for all conditions of operation was amended. This review, and any amendments that were made to deficient COIs, was a major step toward ensuring that all small passenger vessels in this highly populated and popular boating area in southern California will be operated with the proper number of Coast Guard licensed and certificated persons on board.

This action resulted from a recommendation by the Safety Board following the capsizing of a San Diego-based U.S. charter fishing vessel in Mexican territorial waters off the western coast of Baja, California, about 150 miles south of San Diego. Ten of the 12 persons on board the vessel lost their lives in this accident. The vessel's COI did not clearly indicate how many deckhands were required to be on board under the various conditions in which the vessel operated. The Coast Guard manning requirements vary according to the duration of the trip and distance from safe harbor of refuge that a vessel operates. In this particular incident, the vessel was operating with less than the proper number of deckhands on board. As a result of the Coast Guard's action, similar situations should not occur.

Manning requirements of small passenger vessels has been among the key issues in a number of accidents recently investigated by the Safety Board. Not only has the number of crewmembers aboard such vessels been examined, the Coast Guard's requirements for the licensing of personnel have been scrutinized. Current designs have greatly increased the number of persons carried aboard small passenger vessels without any significant increase in licensing requirements. The Safety Board will continue to urge the Coast Guard to upgrade the requirements for licensing of marine personnel on small passenger vessels.

Publicity for Exposure Suit Use

The Coast Guard initiated an advisory program to disseminate information to the fishing industry about the effects of hypothermia and the importance of voluntarily equipping commercial fishing vessels with exposure suits in response to Safety Board recommendations. This action to publicize the importance of exposure suits should help reduce the large number of fatalities that occur each year in the fishing industry as a result of hypothermia.

In addition, at the Safety Board's urging, the Coast Guard has elected to expedite regulations to implement the Commercial Fishing Industry Safety Act of 1988 (Act). The proposed rules are expected to be published in the early part of calendar year 1990. The Coast Guard plans to allow fishing vessels already equipped with certain kinds of older exposure suits to retain them on board for use in lieu of requiring the new immersion suits. Because shortcomings have been observed in the thermal protection and watertight integrity afforded by some existing exposure suits, the part of the proposed rules addressing the requirement for and the conversion to the new immersion suits will be carefully reviewed by the Safety Board. Also, should implementation of the new regulations be slowed by consideration of less urgent or complex portions of the Act, the Safety Board will consider reiterating its recommendation that separate regulations first be developed for implementing that part of the Act that requires immersion suits and life rafts. These two items of safety are essential to protect persons from hypothermia in those instances where abandoning the vessel becomes necessary, and hence have the greatest potential for preventing the loss of life.

The Board's investigation of the sinking of the fishing vessel WAYWARD WIND in the Gulf of Alaska, involving the loss of life of four members of a six-person crew, highlighted the inadequacy of some exposure suits. The deceased crewmembers were wearing exposure suits that were not fitted with inflatable bladders to buoy the wearer's head above the water, or fitted with lights as they would have been if the vessel had been required to carry Coast Guard approved exposure suits. Also, the vessel was not required to carry a liferaft and did not have one.

One of the primary causes of fatalities in marine accidents occurring in northern waters is hypothermia, a subnormal drop in body temperature due to exposure. Commercial fishing vessels in the United States are classified by the Coast Guard as "uninspected" vessels and, as such, are not subject to the same regulations applied to "inspected" vessels. For example, commercial fishing vessels currently are not required to provide crewmembers with exposure suits for thermal protection against the elements. Because of the nature of the commercial fishing industry, and the necessity that fishing vessels be exposed to severe winter weather in northern waters, crewmembers of commercial fishing vessels are extremely vulnerable to the effects of hypothermia, particularly in the event of an accident involving capsizing or sinking.

Progress of State Laws on Alcohol Use in Recreational Boating

On December 17, 1988, the Safety Board issued a progress report on passage of State laws addressing alcohol use in recreational boating. The Safety Board has been the catalyst for tougher State legislation to curb accidents, fatalities, and injuries in this mode of transportation. In 1989, 8 states adopted tougher boating under the influence laws. Since the Safety Board's original study of this issue was published in 1983, 33 States and 1 U.S. territory have enacted more enforceable boating-while-intoxicated laws.

With the passage of these tougher laws, a number of new programs have been introduced to address impaired boat operators. Programs such as Maryland's SWAMP (Safe Waterways Through Alcohol Monitoring Patrols) and similar programs in California and Missouri have been successful in reducing accidents, injuries, and fatalities. For example, in the 5 years before

Maryland initiated the SWAMP program, the State's overall boating fatality average was 29.1 deaths per year; the average annual fatality rate for the 5 years since the initiation of SWAMP operations is 16.2 deaths -- a reduction of 44.5 percent.

The Safety Board continues to support legislative initiatives by the States, and provides information and support to the States upon request.

PIPELINE

Safety of the Public through Land Use Planning

In September 1988, in response to the Safety Board's recommendation, the Transportation Research Board of the National Academy of Sciences published, its Special Report 219, Pipelines and Public Safety, which included the results of its study of public policies relating to the use of lands adjacent to pipelines that transport hazardous commodities. The report assessed the adequacy of existing public policies to provide reasonable safety to persons residing or working on lands adjacent to pipelines and it concluded that additional protective measures should be taken. Twenty-six recommendations for improvements were made to Federal and State governments and to the private sector to enhance public safety near pipelines. The recommendations were in the areas of damage prevention, public awareness, land use practices, and emergency preparedness programs.

The hazard this presents became apparent during a pipeline accident in West Odessa, Texas, on March 15, 1983. Residents of a housing development in West Odessa were using a power auger to dig holes in preparation for planting trees. As they were drilling, the auger struck and damaged an 8-inch liquefied petroleum gas (LPG) pipeline. The pipeline ruptured, and LPG escaped and ignited. Five persons were killed and five persons were seriously injured as a result. Although there were markers on the pipeline, there were none in the immediate area and there were no restrictions on how close to the path of the pipeline structures could be placed.

Traditionally, gas and liquid transmission lines were built in isolated areas, away from concentrations of people, where a failure would present little danger to the public. As the Nation's population has increased, urban expansion has increased public exposure to the hazards of pipeline failures.

This problem was again highlighted in the Safety Board's investigation of the May 25, 1989, rupture of a Calnev Pipe Line Company products pipeline adjacent to a subdivision in San Bernardino, California. Gasoline under more than 1,600 psig pressure sprayed from the rupture drenching many homes before it was ignited, resulting in additional deaths and injuries and destruction of homes. This same neighborhood had been devastated on May 12, 1989, by the derailment of a Southern Pacific Transportation Company train. Previous to these accidents, the Office of the California State Fire Marshall distributed thousands of copies of Special Report 219 to city and county agencies throughout the State to enhance the ability of local governments in recognizing the hazards to public safety posed by pipelines and to encourage improvements in local land use planning decisions relative to the development of lands adjacent to pipelines.

HAZARDOUS MATERIALS

Shipment of Hazardous Materials by Air

During 1988, the Safety Board issued 16 recommendations for improving the shipment of hazardous materials by air. The recommendations resulted from the Safety Board's investigation of an incident aboard American Airlines flight 132 en route to Nashville, Tennessee, from Dallas/Ft. Worth, Texas, on February 3, 1988. The airplane was carrying about 119 passengers, 6 crewmembers, and 1 deadheading 727-qualified first officer.

While on approach to the Nashville airport, a flight attendant reported to the cockpit first officer that smoke and a very bad smell had entered the cabin. The deadheading first officer also told the cockpit first officer that the aircraft floor was dropping out slightly, and that the aircraft should be landed immediately. After the aircraft landed, the deadheading first officer informed the cockpit first officer that heat and smoke were coming up through the floor of the aircraft. The cockpit crew then ordered a quick evacuation of passengers, requested fire equipment from the airport, and reported a possible fire in a cargo compartment to the tower.

The source of the heat and smoke originated from a fiber barrel, loaded on its side into the middle compartment of the aircraft at Dallas/Ft. Worth airport. The fiber barrel contained 5 gallons of hydrogen peroxide (oxidizer) and 25 pounds of a corrosive solid. The shipper failed to inform the carrier that the fiber barrel contained hazardous materials.

As a result of the Board's investigation of this accident, American Airlines is revising its general freight acceptance procedures, including the training of employees for accepting general freight; is redesigning its hazardous materials restrictions notices to ensure the signs capture the attention of shippers and passengers; and is modifying its evacuation procedures and passenger safety information cards to make them consistent. American Airlines also has modified its shipping papers to require persons proposing to ship goods aboard its aircraft to affirm that the proposed shipment either does or does not contain hazardous materials.

In addition, the Research and Special Programs Administration (RSPA) and the FAA have formed a joint task group to evaluate whether to prohibit the transportation of certain classes of hazardous materials in cargo compartments that are not equipped with fire/smoke detection and fire extinguishment systems. These agencies also are working jointly on a regulatory rulemaking project that addresses the posting of hazardous materials restriction notices at locations where hazardous materials are offered for transportation by aircraft.

Separately, the FAA is increasing its monitoring of hazardous materials restriction signs during facility inspections; is defining specific requirements for hazardous materials warning signs; and has amended its existing regulations to require fire/smoke detection and fire extinguishment systems for all Class D compartments more than 200 cubic feet in volume.

Also, the shipper of the hydrogen peroxide has developed and implemented a hazardous materials safety training program for those employees responsible for packaging, shipping, or transporting hazardous materials. Moreover, the Air Transport Association of America has developed shipper educational materials to make shippers more aware of the restrictions and requirements for shipping hazardous materials by air and currently is developing similar information to enhance passenger awareness of the hazards posed by materials they might include in their luggage.

Vehicle Loading and Unloading Procedures

During the past year, several safety improvements in the procedures for loading and unloading of hazardous materials have been realized in the rail, marine, and highway modes. On July 26, 1989, the DOT issued a notice of proposed rulemaking that, if adopted, would require enhanced training of persons, such as those who load and unload hazardous materials, to reduce the consequences of human error; the largest cause of hazardous materials transportation incidents.

In railroad, the Archer Daniels Midland Company has stated that it will develop consistent, standard loading practices at its plants that produce denatured ethyl alcohol (classified as a flammable liquid and used to produce gasohol as an automotive fuel), and to monitor operator performance. The company's actions are in response to the Safety Board's investigation of the release of denatured ethyl alcohol from 2 rail tank cars derailed as result of the head-on collision of two Iowa Interstate Railroad freight trains in Altoona, Iowa, on July 30, 1988. Damage to the two tank cars was minimal; however, product leaking from the closure fittings on each tank car ignited and burned for approximately 2 days. Although the leaking fittings were not causal, the burning tank cars increased the severity of the accident, and resulted in the evacuation of local residents. Total damage was estimated to exceed $1 million.

In highway, the Hoechst Celanese Corporation has indicated, in reply to a Board recommendation, that its discharge procedures for sulfur dioxide are being revised, and that additional training will be given to company drivers. On December 28, 1988, a driver for Hoechst was fatally overcome by a release of sulfur dioxide, an irritating and corrosive gas, during unloading from the Hoechst tank trailer to a customer's storage tanks. The driver, who was working alone, did not have any respiratory protection device in the tractor.

In marine, both the U.S. Coast Guard and the Independent Liquid Terminals Association (ILTA) took action to improve the safe transfer of hazardous materials between ships and shoreside terminals. These actions were taken as a result of the Safety Board's investigation of the 1986 fire on board a tank ship and two tank barges at the Intercontinental Terminals Company facility in Deer Park, Texas. Two persons were killed, and damages to the facility and the vessels were estimated to be $5 million. The Board's report of this accident identified a number of important safety problems involved with the transfer of hazardous materials between ships and shoreside terminals.

The Coast Guard will amend Federal regulations to prohibit the use of visibly damaged cargo transfer hoses in the transfer of hazardous materials at U.S. waterfront facilities. The Independent Liquid Terminals Association, in response to five Safety Board recommendations, advised its members operating waterfront facilities of the need and importance of following safe loading practices during cargo transfer operations. Specifically, the association advised its members to verify that the pressure ratings of cargo transfer hoses are compatible with the pressures required for their intended use, to review dockman relief procedures for proper exchange of operational information, to review the adequacy of transfer procedures in terminal operating manuals, and to use a checklist that identifies critical procedures for cargo transfer. The association also addressed these recommendations at each of its four regional meetings.

As a result of this accident and previous accidents, the Safety Board recognized that a lack of safe vehicle loading and unloading practices occur in all modes. Consequently, the Safety Board recommended in March 1988 that the Department of Transportation (DOT) establish safety requirements for the movement and storage of hazardous materials at intermodal transportation facilities, and that the DOT also strengthen requirements for loading and unloading hazardous materials to provide uniform safety in all modes of transportation. The DOT has responded positively to both recommendations, and has undertaken a review of its regulation of intermodal facilities. DOT modal agencies are examining regulatory requirements for loading and unloading operations.

Truck Tank Trailer Integrity

Safety Board findings from its many accident investigations that involved highway tank trailers was instrumental in the final cargo tank rules issued on June 12, 1989, by the DOT. Although taking almost five years to complete, the rules now require independent certification of many manufacturing processes; require that ring-type stiffeners be designed to allow full visual inspection; require inclusion in the design standards of protection during accident environments; require improved overpressure and vacuum protection; require improved periodic visual inspection; require inspectors to meet specific qualifications; and require improved design of closures to prevent release of hazardous materials during roll-overs and other accident conditions. The need for cargo tank improvements has been documented in many Safety Board reports including the January 5, 1988, collapse in Senora, Kentucky, of a tank trailer transporting a flammable liquid.

Emergency Response Communication Standards

On June 27, 1989, the DOT published its final rule that imposed new requirements for emergency response information on shipping papers and placement of emergency response information on transportation vehicles and at transportation facilities. This effort began in 1984 in response to the Safety Board's findings from its investigation of an October 1982 overturn of a highway tank trailer at Odessa, Delaware.

The new provisions, in part, require improved information on shipping papers about the hazards of the materials being transported; require a 24-hour emergency telephone number be listed on the shipping paper where responders to emergencies will be able to obtain specific additional technical information that may be needed on the hazardous materials; require carriers of hazardous materials to maintain emergency response guidance information on materials transported; and establish conditions that must be met for the shipper to list any agency or person other than itself as the emergency contact.

FUTURE PLANS

The Safety Board's current and long-term priorities are reflected in its Management Objectives, Accident Selection Criteria, Significant Safety Issues, and Safety Studies. Within funding and personnel limitations, the Board proposes to accomplish the following plans to assure the public's confidence in the safety of the Nation's transportation system and provide the highest potential safety payoff.

MANAGEMENT OBJECTIVES

- Provide sufficient funding to maintain the necessary depth at key positions and assure adequate compensation in overtime, awards, and other essential areas to maintain an effective workforce.
- Continue emphasis on allocating Board investigative resources to ensure the public's confidence in the transportation system and provide the highest potential safety payoff.
- Issue investigative reports, safety studies, and recommendations of the highest quality.
- Issue Safety Board accident reports within nine months of the date of the accident.
- Vigorously follow up with safety recommendation recipients to assure prompt adoption of safety recommendations.
- Continue to implement cost-effective management improvements to more effectively utilize our limited resources.
- Implement improvements to increase productivity, including maximum use of automation.
- Maintain the highest levels of technical expertise to deal effectively with transportation accidents and incidents involving sophisticated technological applications.
- Improve communications between the Board, the public, government, trade associations, public interest groups, and industry to promote mutual understanding of safety problems and realistic, expeditious solutions.
- Create a positive work environment for all Board staff to improve staff retention and facilitate the hiring of high quality staff.

ACCIDENT SELECTION CRITERIA

The Board investigates aviation, railroad, highway, marine, pipeline, and hazardous materials accidents. Under its accident selection criteria, the Board's investigative response will depend primarily on the following factors: 1) the need for independent investigative oversight of certain specified areas to ensure public confidence in the transportation system; 2) the need to concentrate attention and resources on the most significant and life-threatening safety issues; and 3) the need to maintain an adequate data base on which trends can be identified and projected.

Aviation Accidents

1. Oversight/public confidence:
   a. All Part 121 and 135 accidents.
   b. Foreign aircraft accidents involving U.S. airlines; U.S. manufactured aircraft; or major U.S. manufactured components (e.g., engines).
   c. Air traffic control operations.
   d. Accidents involving potential flight training or crew experience as factors.
   e. Midair collisions.
   f. Newly-certificated aircraft.
   g. Newly-certificated engines.
   h. Inflight fire
   i. Inflight breakup.
   j. All other fatal aviation accidents.

2. Selected emphasis areas:
   a. Part 91 accidents with elements common to Part 121/135 operations.
   b. Commercial passenger flight incidents with safety recommendation potential.
   c. Air traffic control incidents with safety recommendation potential.
   d. Aging aircraft.

3. Data collection needs.

Railroad Accidents

1. Oversight/public confidence:
   a. Commercial passenger services, including rail rapid transit accidents, which result in:
      -- a passenger fatality or serious injury to two or more persons; or
      -- an onboard fire with evacuation of passengers; or
      -- property damage of $25,000 or more; or
      -- collisions with on-track equipment.

b. All accidents which involve an employee fatality or serious injury to two or more persons or result in damage of $500,000 or more to railroad and non-railroad property.

2. Selected emphasis areas:

   a. Alcohol/drug use by railroad operating employees.
   b. Railroad/highway grade crossing accidents which involve commercial vehicles, or school or public transportation vehicles.
   c. Release of hazardous materials.

Highway Accidents

1. Oversight/public confidence:

   a. Fatalities and injuries in public transportation vehicles (i.e. school buses, commercial intercity/transit buses).
   b. Collapse of a major bridge structure.
   c. Highway/railroad grade crossing accidents which involve commercial vehicles, or school or public transportation vehicles.

2. Selected emphasis areas:

   a. Crashworthiness of intercity/transit buses.
   b. Commercial vehicle/heavy truck operation involving:
      -- driver alcohol/drug use, qualifications, training, or licensing.
      -- carrier policies concerning driver selection, training, supervision, or vehicle inspection and maintenance.
      -- roadway hazards, including dangerous construction zones.
   c. Fire safety in school buses and heavy trucks.

Marine Accidents

1. Oversight/public confidence:

   a. Loss of six or more lives.
   b. Loss of a self-propelled vessel over 100 gross tons, or damage to any vessel exceeding $500,000.
   c. Serious hazardous materials threat to life/property/environment.
   d. Coast Guard safety functions (e.g., Vessel Traffic Services, search and rescue, inspections, etc.).
   e. A public and nonpublic vessel collision with one or more fatalities or $75,000 or more in property damage.

2. Selected emphasis areas:

   a. Passenger vessels including ocean cruise ships and excursion vessels, ferries, and harbor excursion boats.
   b. Crew boats, mobile offshore drilling units, and research vehicles.

   c. Recreational boating accidents that involve national safety problems including alcohol and drug abuse.
   d. Release of a hazardous material or dangerous cargo on the inland waterways or harbors of the United States.

   e. Ramming or collapse of major highway and railroad bridges that span navigable waters.
   f. Public vessels including training vessels.
   g. Oversight of pilot performance.
   h. Tug and towboat operational safety.
   i. Commercial fishing vessel safety.

Pipeline Accidents

1. Oversight/public confidence:

   a. One or more fatalities.
   b. Damage exceeding $500,000.
   c. Extensive release of highly volatile liquids.

2. Selected emphasis areas:

   a. Pipe failure when pressure is within design parameters.
   b. Excavation-caused accidents with catastrophic losses.
   c. Inability of operator to promptly identify failure or to rapidly isolate failure within densely populated area.
   d. Failures involving ineffective system surveillance.

Hazardous Materials Accidents

1. Oversight/public confidence:

   a. Fatalities and injuries resulting from released hazardous materials.
   b. Releases of hazardous materials necessitating major evacuations of the public.

2. Selected emphasis areas:

   a. Failure of containers resulting in major release of hazardous materials.
   b. Improper preparation of hazardous materials by shippers that result in major releases during transportation.
   c. Ineffective emergency response resulting from insufficient or improper technical information on the hazardous materials included in a transportation accident.

SIGNIFICANT SAFETY ISSUES

The following significant safety issues, which have been identified and explored in completed or ongoing Safety Board investigations and studies, provide further examples of the Board's efforts to ensure public confidence in the Nation's transportation system.

AVIATION

General Electric Engine Problems

The Board's preliminary investigation of the United Airlines DC-10 accident in Sioux City, Iowa resulted in an urgent Safety Recommendation on August 17, 1989. The recommendation requested that the FAA conduct a directed safety investigation of the General Electric CF-6 turbine engine to establish a cyclic threshold at which the fan forward shaft and fan disks should be separated and inspected for defects. Additional recommendations were made to issue appropriate airworthiness directives where applicable and to conduct additional safety studies of similar GE engine products.

The missing titanium fan disk involved in the Sioux City accident was recovered in rural Iowa during October 1989. Under direction of the Safety Board, inspection of the disk fragments is continuing at GE facilities in Ohio and other laboratory facilities. Early indications are that the disk contained a defect that was undetected during manufacture or subsequent operation by the carrier. This discovery has led to a reevaluation of the titanium manufacturing processes and methods used to insure quality for titanium parts used on a wide variety of turbine engines. The Board is also currently involved in extensive investigations of part manufacturing processes and inspection methods at both the supplier and user levels. Meetings with Pratt and Whitney have been held in an effort to assess the potential for disk failure in other turbine engines similar to GE's.

The Safety Board is also considering the issue of containment of failed engine parts. Containment of fragments within the engine would eliminate the hazards to the airplane and its systems.

Aging Aircraft

The airworthiness of the U.S. aging aircraft fleet is an issue justifying continued and emphasized attention by the airlines, airframe manufacturers, and the FAA. The average airplane of the U.S. air carrier fleet is more than 12 years old. More than 500 airplanes (Boeing 727s and McDonnell Douglas DC-9s) are over 20 years old. Commuter fleet airplanes, built and certified to less stringent standards than the jet transport category airplanes, are also reaching significant age.

In June, 1989, a United Airlines mechanic in Denver noticed a crack about five inches long extending below a lap joint just below the windows of a Boeing 727-100 airplane. The airplane had been delivered to United in 1964 and had flown over 62,000 hours. Upon closer inspection the crack was found to be about 20 inches long, most of which was hidden by the overlapping skin of the joint. It appears that the crack initiated and progressed through fatigue from rivet hole to rivet hole in an area where the adhesive in the lap joint had become disbonded. Since there had been no previous indications of a problem with this particular lap joint, inspection and repair requirements had not been imposed.

Similar cracking was also found on the fuselage of an early line number Boeing 737, N462AC, in September of 1989. Investigation revealed that the visually detected cracking was part of a 35-inch long crack that was largely hidden by overlying skin of the lap joint just below the windows. Smaller areas of cracking were also found in the lap joint opposite the 35 inch long crack. On December 26, 1988, the flightcrew of an Eastern Airlines Boeing 727 was forced to make an emergency landing after an approximate 9- by 20-inch hole in the aircraft's fuselage caused a loss of cabin pressure at 31,000 feet. Shortly thereafter, on December 28, 1988, another Eastern Boeing 727 airplane was found to contain a 3-inch crack in the fuselage resulting from corrosion.

These occurrences reemphasized the need for continued attention to the aging aircraft issue and in particular the inspection requirements for adhesive bonded lap joints.

ATC System Operational and Managerial Deficiencies

On September 17, 1988, a Cessna 172, N6586J, crashed into a mountain near Adams, Massachusetts. The pilot was seriously injured and the two passengers were killed. The pilot was flying under visual flight rules (VFR) from Westerly, Rhode Island, to Bennington, Vermont, when he became disoriented and declared an emergency. At the time of the crash, the pilot was on a radar vector issued by a controller at the Boston Air Route Traffic Control Center (ARTCC). The controller had allowed the pilot to maintain 3,000 feet in an area where the minimum vectoring altitude was between 4,700 and 5,000 feet. The last transponder return received by the Boston Center indicated that the airplane was at an altitude of 2,700 feet.

The Safety Board's investigation of this accident identified ATC operational and managerial deficiencies which were evident immediately prior to the crash. As a result of it's investigation, the Safety Board issued 11 safety recommendations to the FAA which it believes will provide an added measure of safety to the pilots of VFR aircraft who encounter an emergency situation.

Visual Acuity Standards for Air Traffic Controllers

On August 9, 1987, an operational error occurred involving loss of standard separation at the New York Terminal Radar Approach Control (TRACON). The incident involved two Boeing 727s where a controller confused the similar flight call signs and issued instructions to one flight that were actually intended for another. Within a few minutes after this incident, the same controller again confused two other flights; however, the confusion did not result in a loss of separation.

The Board's investigation of these incidents revealed deficiencies related to the visual acuity standards and the corrected vision requirements for controllers. The Safety Board believes that this controller had a normal aging condition called presbyopia which causes defective accommodation and inability to focus properly for near vision. The controller had difficulty reading a three-digit access code posted about 3 feet from the controller with a type size of 11 characters per inch. A review of the controller's medical records disclosed that he held a second-class medical certificate with the limitation, "Holder shall possess correcting glasses for near vision while exercising the privileges of his airman certificate." The controller said that his eyeglasses were in his shirt pocket at the time the incident occurred. A subsequent review of the FAA medical standards for air traffic controllers revealed no requirement to wear corrective glasses for either near vision or distant vision while performing their duties as controllers. The Safety Board believes that the visual acuity standards should be tailored for the specific distance ranges dictated by the tasks to be performed and that controllers should be examined for all applicable ranges.

As a result of its investigation of this incident, on August 11, 1989, the Safety Board issued 8 safety recommendations to the FAA which it believes will reduce the frequency to which controllers would provide service to aircraft that have similar sounding radio call signs and also to standardize visual acuity requirements for air traffic controllers.

Commuter Flightcrew Experience, Qualifications, and Training

The Safety Board remains concerned about commuter flightcrew experience and qualifications, pilot training programs, and the continued need for enhanced oversight by the FAA. While measurable progress has been achieved, as indicated by a declining overall rate in accident and incident mishaps, the accidents and incidents that continue to occur share the same operational deficiencies that have been documented by Board investigations for well over a decade. The exodus of experienced pilots and flightcrews from commuter operations to the major carriers has weakened the intended goal of an "equivalent level of safety." The Board's concern is heightened by the mixing of relatively inexperienced flightcrews with second-generation aircraft incorporating state-of-the-art cockpits that require state-of-the-art training programs. Through accident investigations, the Board has discovered that the qualifications listed by some pilots on their application for employment were not accurate. The Safety Board believes that carriers must ensure that pilots and other flight crewmembers are properly certificated and qualified for the duties they perform. To this end, the Safety Board issued a recommendation to the FAA to provide guidance to operators of scheduled revenue passenger service to assist them in obtaining relevant information from previous employers about the piloting skills and abilities of prospective pilots. On November 29, 1989, the Safety Board held a commuter safety workshop to examine issues related to pilot availability, turnover, training, and new FAA initiatives.

On October 28, 1989, about 7:00 P.M. local time, an Aloha Island Air, Inc. DHC-6-300 Twin Otter on a scheduled flight operating under visual flight rules from Kahaliu, Maui, to Molokai, Hawaii, struck a wall of the Halawa Valley and was destroyed. Eighteen passengers and the two flight crewmembers aboard the flight were fatally injured. Weather in the vicinity at the time reportedly included low ceilings and heavy rain showers, under darkness conditions. The company's pilot training and check airman programs, and FAA's oversight of these functions are being examined as a part of the Safety Board's continuing investigation of this accident.

Air Carrier Pilot Training and Experience

One of the outgrowths of airline deregulation has been the significant increase in demand for qualified pilots. Prior to deregulation, pilots who met basic qualifications spent years improving their skills before being hired or placed into more demanding positions. Now, however, minimally qualified pilots are moving into more demanding positions without the experience and seasoning that had previously been prerequisites for those positions. In many cases, these minimally qualified pilots start their careers with a commuter airline and then, after a short time, move on to a major airline. This situation is exacerbated by the high turnover of pilots in the commuter airlines -- about 40% overall and as much as 100% in some cases. This results in a decrease in the overall level of experience in the cockpits of the jet transport category fleet of major airlines as well.

For example, on September 20, 1989, a Boeing 737-400 aircraft operated by US Air, Inc. overran a runway during a rejected takeoff attempt at La Guardia Airport, Flushing, New York. The aircraft came to rest with the nose wedged atop an approach light trestle and with the fuselage broken and partially submerged in deep water; two passengers died in the accident. The captain had been qualified on the aircraft for two months, and the first officer for one month. The Safety Board's investigation of this accident is not complete; therefore, the relevance of the pilots' training and experience in this accident have not been determined. However, the adequacy of pilot training, FAA oversight of such training, and the pairing of pilots with limited experience, is among the issues being examined.

Flight Recorders

In spite of the progress achieved by the Safety Board in obtaining improved flight recorder standards, it must continue to actively monitor the technological development and operational requirements of new aircraft, such as the A320 and the B747-400, in order to assess future flight recorder requirements. The continued technological growth in the aircraft industry will place an increasing demand on the Safety Board's ability to maintain its accident investigation expertise. Therefore, the Safety Board will continue to participate actively in industry organizations, such as the International Civil Aviation Organization, Aeronautical Radio Inc. and the European Organization for Civil Aviation Electronics (EUROCAE), in order to monitor and develop flight recorder standards for the next generations of aircraft.

In November 1988, the Safety Board hosted a EUROCAE meeting in Washington, D.C., to develop minimum operating performance requirements for the next generation of flight data recorders that could be used as an international standard. Current U.S. Technical standard orders (TSOs) do not address unique design features, such as solid-state data recording. The work of EUROCAE will correct some of the deficiencies in the existing TSOs. These new standards are vital to the development of recorders for the air taxi and the remainder of the general aviation fleet. During the final EUROCAE flight recorder meeting in May 1989, the FAA agreed to accept the EUROCAE standard when it is completed later this year. The extent of implementation of these recorder standards will be determined by the expense of the solid-state memory improvements and the packaging of these electronics in crash-protected containers.

Runway Incursions

Twelve years after the most serious accident in aviation history, runway incursions continue to occur and remain a significant safety concern. Almost 600 people died in the collision of two Boeing 747s on a runway at Tenerife, Canary Islands, on March 27, 1977. The Safety Board believes that inadequate scanning of the runways and approach paths and forgetfulness on the part of controllers are the principal ATC-related causal factors associated with runway incursions.

The Safety Board is encouraged by several ongoing projects which are attempting to address the problem of runway incursions. At the JFK International Airport in New York, a stop bar lighting system is under operation and evaluation by controllers and pilots. This system, when used in conjunction with verbal instructions from controllers, will provide pilots with a redundancy to confirm the accuracy of instructions to cross an active runway. Unfortunately, the Safety Board is concerned that this project requires controller interaction and does not recognize the fact that human error on the part of pilots and controllers is possible even under the best of circumstances.

Another project currently undergoing testing is the airport surface detection equipment (ASDE-3) radar, which is a high-resolution, ground-mapping radar system that is planned for installation at 29 major U.S. Airports. Recently, Norden Systems, Inc., who developed this system, demonstrated to Safety Board staff an enhancement to the ASDE-3 system, the runway incursion management (RIM) system, which is meant to operate in conjunction with and can be integrated into the ASDE-3 radar. The RIM system, through the use of runway incursion algorithms, provides the logic to analyze aircraft and vehicle movement on the surface and generate warnings and alerts for display to the air traffic controllers. An operational demonstration is scheduled to begin at the Pittsburgh Airport, which is the first ASDE-3 site. The Safety Board views this project as a positive step in addressing the runway incursion problem, but remains concerned that the equipment is scheduled to be available only at a limited number of major airports.

Despite these efforts, the Safety Board is concerned that the problem of runway incursions will become more acute as en route and terminal capacity enhancement programs are implemented.

Infant and Small Child Restraints

On July 19, 1989, a United Airlines DC-10-10 with 285 passengers and a crew of 11 crashed and burned at Sioux City, Iowa. One flight attendant and 110 passengers were killed. Three of the four in-lap infants who were onboard sustained minor injuries and one infant died of smoke inhalation. None of the infants occupied any kind of restraint device; i.e., an FAA approved car seat.

In accordance with United Airlines' procedures to prepare passengers for an emergency landing, the parents were instructed to place their infants on the floor and protect them with blankets and pillows and to hold the infants on the floor with their hands when the parents assumed their brace for impact positions. Three parents complied with these instructions; the Safety Board was not able to determine what the fourth parent did although her infant survived the accident. During the impact, two of the infants were pulled from their mother's grasps and were not seen when the airplane stopped. One of these infants (23 month-old) died of smoke inhalation and the other (11 month-old) was rescued by a passenger who re-entered the airplane when he heard a baby crying. The third infant, a 23 month old boy, bounced off the floor into his mother's arms during the impact and although her son's head hit the sidewall several times, she was able to hold onto him and carry him out of the wreckage.

The use of FAA-approved car seats was addressed during the Safety Board's public hearing following the United accident. The FAA and the Air Transport Association (ATA) testified to the obvious crash protection benefits to infants and small children who occupy FAA-approved car seats. However, both testified that some airlines do not permit car seats on board their aircraft and further that some airline employees do not know that FAA-approved car seats may be used and thus deny their use. The ATA stated that because some car seats are too large to fit onto passenger seats safely, the ATA plans to work with car seat manufacturers to reduce the size of their seats. The FAA testified that a rulemaking project would examine the need to require infants and small children to occupy approved car seats or other restraint devices.

Since the United accident, the Safety Board has pursued the safety of infants and small children before the Congress, the media, and public interest groups, to demonstrate the need for the FAA to expedite rulemaking. In September 1989, the Board testified before the House Public Works and Transportation Subcommittee on Aviation and endorsed the use of FAA-approved car seats to protect infants and small children from injury during inflight turbulence and crash impacts.

RAILROAD

Advanced Train Control Systems

The Safety Board has long been an advocate of systems which provide backup control when an engineer fails to properly control a train. To that end, the Board has made several safety recommendations to the Federal Railroad Administration (FRA) to require systems to ensure that trains are controlled as required by signal systems, and that locomotives be equipped with alerting devices. Although the railroad industry is actively involved in designing and testing advanced train control systems, the FRA does not require such safety devices. (See Safety Studies section on "Train Separation and Collision Avoidance")

On January 4, 1987, an Amtrak passenger train collided with a Conrail locomotive at Chase, Maryland. The Conrail locomotive was not equipped with any device or system to control the train as required by the signals. As a result of that accident, the FRA has ordered all users of the Northeast Corridor to install train control systems on those trains which will be operated on the corridor (see Safety Accomplishments section on "Backup Devices on Conrail Locomotives"). However, the Safety Board is concerned about other operational locales. As a result of its investigation of a collision between a Boston & Maine commuter train and a Conrail freight train at Brighton, Massachusetts, on May 7, 1986, the Safety Board recommended that the FRA promulgate Federal standards to require the installation and operation of a train control system on main line tracks which will provide for positive separation of all trains. In its report of this accident, the Safety Board urged the FRA to take an active leadership role to help formulate the operational and safety aspects of the development and installation of an advanced train control system. The Safety Board is continuing to monitor this issue in accident and incident investigations.

Locomotive Crashworthiness

In 1970, the Safety Board issued its first safety recommendation to the FRA, calling for timely improvements in the crashworthiness of railroad equipment, particularly locomotive operating compartments. Since that time, accident investigations have continued to demonstrate that improvements are needed in the crashworthiness design standards for locomotives. The head-end crew should be afforded far more protection than current design of locomotive operating compartments provide.

In a letter to the Safety Board dated May 3, 1971, the FRA outlined its concerns and subsequently met with locomotive manufacturers, labor organizations, rail carriers, and the Association of American Railroads.

On January 16, 1973, the FRA advised the Safety Board that it was planning a program to test locomotive control compartments to determine cab crashworthiness, and that the test program would be used to establish requirements for anti-climb devices and other safety enhancements.

Since then, the Safety Board investigated accidents near Leetonia, Ohio, on June 6, 1975; near Marland, Oklahoma, on December 15, 1976; in Goldonna, Louisiana, on December 28, 1977; at Florence, Alabama, on September 18, 1978; at Beverly, Massachusetts, on August 11, 1981; and at Pacific Junction, Iowa, on April 13, 1983, which resulted in further safety recommendations being issued to the FRA regarding locomotive crashworthiness protection.

The FRA responded on April 30, 1984, that it intended to commence a safety inquiry on issues of health and safety in the locomotive cab which would be the subject of one or two major safety efforts for the year then ahead. In its investigation of an accident near North Platte, Nebraska, on July 10, 1986, the Safety Board noted that the time for studying the problem had long since passed, and the head-end crews should be afforded more protection than is available in current locomotive operating compartments. Once again, the Safety Board recommended that the FRA promptly require that locomotive operating compartments be designed to provide crash protection for occupants of locomotive cabs.

The Safety Board's investigation of a head-on collision between two Southern Pacific freight trains at Yuma, Arizona, on June 15, 1987, again highlighted the need for improved and standardized locomotives designed to provide protection to on-board personnel. As a result of its investigation of the Yuma collision, the Safety Board recommended that the FRA require compatible main frame sill height standards on locomotives. The FRA has not yet responded to the Safety Board regarding this safety recommendation.

The lack of a standard for a common sill height has resulted in numerous fatalities and injuries because of one locomotive overriding another. Anticlimbers, at present the only countermeasure, have proven through accident investigation experience to be ineffective at speeds greater than 5 mph. The Safety Board believes that the FRA must mandate a standard to prevent the overrides that occur in collisions. Measures to improve the integrity of the locomotive cabs in collisions or other accidents are also presently available.

A report prepared for the FRA by the National Space Technology Laboratories (NSTL) on locomotive cab safety states that 78 percent of all head-on and rear-end collisions occur at speeds of 15 mph or less. Further, the report states that 76 percent of all injuries in collisions occur at 15 mph or less, and that 60 percent of all fatalities occur in that same speed range. During the 5-year period (1983 - 1987) cited by the study, there were 332 head-on and rear-end collisions; 47 people died and 586 people were injured in those collisions. Damages in those collisions exceeded $74 million.

The Safety Board believes the present state of locomotive cab safety is unsatisfactory, and that the FRA must move quickly to rectify these problems.

Passenger Rail Car Crashworthiness

The Safety Board has had a longstanding concern with the safety of passenger car interiors as a result of numerous investigations of passenger train accidents. Seat and seat restraint failures cause seat rotations, eject passengers during a derailment, and result in injuries. Unpadded metal seat parts contribute to the severity of second-impact injuries. Unrestrained baggage falling from overhead compartments cause additional injuries.

Emergency evacuation of derailed passenger rail cars also has been a concern of the Safety Board. Evacuations of derailed equipment often are not accomplished rapidly or effectively, which could be disastrous in case of a fire. Another concern is the inadequacy of emergency lighting in rail passenger cars, which can complicate rescue efforts.

The Safety Board has made numerous safety recommendations to the FRA and to Amtrak to remedy these problems. Although Amtrak has generally been responsive to these safety recommendations, the FRA has concluded that no further action is necessary. While all of the injury-producing features in passenger car interiors have not yet been eliminated, the Safety Board is generally encouraged by Amtrak's efforts to improve passenger car interiors. The Safety Board will continue to monitor Amtrak's efforts to correct these problems.

Transport of Hazardous Materials by Rail

Railroad accidents have a wide-ranging potential for disaster when hazardous materials are involved. For example, on February 2, 1989, runaway freight cars collided with locomotive units in Helena, Montana. In addition to personal injuries, the explosion of a tank car containing hydrogen peroxide caused extensive damage to the city, and evacuation of many of its residents. As part of its investigation of this accident, the Safety Board focused on several issues that have been addressed in similar rail accidents investigated by the Board. These include:

- the lack of puncture resistance protection, such as head shields on tank cars used to transport hydrogen peroxide and other high-risk hazardous materials; and
- the practice of the Department of Transportation (DOT) to determine product/tank car combinations that provide sufficient protection for the transportation of hazardous materials in tank cars.

The Safety Board concluded that safety risks are taken when hydrogen peroxide and other high-risk hazardous materials are transported in tank cars without puncture resistance protection, such as head shields, and that the DOT has not used safety analysis methods to identify unacceptable risks in transporting hazardous materials and to determine the degree of risk presented by the release of hazardous materials. Consequently, the Safety Board recommended that the DOT evaluate present safety standards for tank cars transporting hazardous materials by using safety analysis methods and modify existing regulations to achieve acceptable levels of safety for each product/tank car combination. The Safety Board also reiterated to the Federal Railroad Administration, the Research and Special Programs

Administration, and the American Association of Railroads its previous recommendations for head shields on aluminum tank cars, and it urged that action be expedited to require this protection. In addition, the Safety Board is conducting a safety study on "Transportation of Hazardous Materials by Rail" (see Safety Studies section) that will focus on other issues identified in Safety Board investigations.

Independent Safety Oversight of Rapid Transit Systems

At the present time, only the States of New York and California actively exercise any regulatory oversight of rapid transit systems in their localities. The Urban Mass Transportation Administration of the U.S. Department of Transportation does not exercise any regulatory oversight of safety aspects of rapid transit systems. As a result of several of its investigations of accidents on the New York City Transit Authority (NYCTA), the Safety Board made a recommendation to the Governor of the State of New York which resulted in the formation of the New York State Public Transportation Safety Board. The creation of that agency to oversee the safety aspects of the NYCTA has significantly enhanced the effective resolution of previously-identified safety problems in the NYCTA (see Safety Accomplishments section on "NYCTA Improvements").

The Safety Board has recently issued a recommendation to the Governor of the State of Ohio to initiate action to create an agency or enable an existing agency to oversee and regulate the safety of rail rapid transit in the State of Ohio. This recommendation was the result of the Safety Board's investigation of a collision on the Greater Cleveland Regional Transit Authority. The Safety Board is also investigating several accidents on the Southeastern Pennsylvania Transportation Authority, which also does not have any regulatory oversight imposed on it by a safety agency.

HIGHWAY

Survival Aspects of Large School Buses

In May 1988, near Carrollton, Kentucky, a church activity bus was struck head-on by a pickup truck killing the busdriver and 26 bus passengers. As a result of its investigation into this accident the Safety Board recommended that the National Highway Traffic Safety Administration upgrade current requirements in Federal safety standards for school buses pertaining to emergency egress, seating material flammability, and fuel system integrity. Also, recommendations were made to the 50 States, church organizations, and activity groups to phase out the use of prestandard school buses and to purchase only poststandard school buses for public transportation purposes.

In September 1989, the Safety Board investigated another school bus/truck collision near Alton, Texas. After impact, the school bus was redirected over an embankment and fell approximately 25 feet into a gravel pit partially filled with water. The bus came to rest on its left side totally submerged in water. Twenty one of the 81 students aboard were killed and 20 others were hospitalized. Although the investigation is still continuing, preliminary results indicate that the fatalities appear to have resulted from drowning or complications related to being submerged in water, and that egress difficulties may have been a factor in the severity of injuries sustained by the bus occupants.

Highway Bridge Safety

As the nation's highway system matures, the Safety Board is becoming increasingly concerned about its aging highway bridges. There are almost 580,000 highway bridges nationwide of which more than 80 percent are over water. In the last six years the Safety Board has investigated the collapse of six major highway bridges over water, three of which have occurred within the last twelve months.

In June of 1983, the Interstate 95 bridge over the Mianus River in Greenwich, Connecticut collapsed killing three people. The Safety Board determined that the probable cause of the collapse was the undetected lateral displacement of the hangers of the pin and hanger suspension assembly in the southeast corner of the span by corrosion-induced forces due to the deficiencies in the State of Connecticut bridge safety inspection and bridge maintenance program.

In April 1985, the Chickasawbogue Bridge on U.S. 43 near Mobile Alabama collapsed. The Safety Board determined that the probable cause of the collapse was the undetected deterioration of the substructure due to the inadequate inspection of the underwater bridge elements by the State of Alabama.

In April 1987, the Interstate 90 bridge over the Schoharie Creek in upstate New York collapsed. There were 10 fatalities. The Safety Board determined that the probable cause of the collapse was the failure of the New York State Thruway Authority to maintain adequate riprap around the bridge piers, which led to severe erosion in the soil beneath the spread footings.

In August 1988, the State Route 675 bridge over the Pocomoke River near Pocomoke City, Maryland collapsed. The Safety Board determined that the State of Maryland failed to respond to the deficiencies noted on inspection reports which led to the deterioration of the submerged piles.

In April 1989, the U.S. 51 bridge over the Hatchie River near Covington, Tennessee collapsed killing eight people. This collapse is still under investigation; however, the Safety Board has found that the river channel had migrated so that a pier not designed to be in the channel was now in the channel.

In May 1989, the Harrison Road bridge over the Great Miami River in Miamitown, Ohio collapsed killing two people. This collapse is still under investigation. At this time it is known that the piles buckled, there was scour in the area of the pier which first collapsed, and there was a large amount of debris in the water at the time of collapse.

The investigation of these events found deficiencies in bridge superstructure and substructure elements which were either not detected by state inspection programs or not corrected by an effective maintenance and repair program. Although the Department of Transportation has been instrumental in persuading states to initiate vigorous bridge inspection programs, the Safety Board is concerned that the inspection data are not thoroughly analyzed by proper engineering staff.

On September 28, 1989, the Safety Board conducted a workshop to discuss effective means for attacking these problems. The workshop brought together both federal and state agencies and private organizations concerned with the safety of our nation's highway bridges. The workshop covered the current condition of the bridges, financial needs of state and local governments, inspection processes and techniques, evaluation methods of inspection results, maintenance and rehabilitation processes, research efforts, and current design practices. As a result of the workshop and its investigations of bridge collapses, the Safety Board believes that continued emphasis needs to be placed on improving the adequacy of bridge inspections and the use of previous inspection data to assess bridge vulnerability, and on providing sufficient funding to state and local governments for the maintenance and rehabilitation of bridges to ensure safety.

Heavy Truck Brake Problems

During 1985-87, the Safety Board investigated 189 heavy truck accidents, as part of a two-phase Safety Study. The majority of the cases involved human performance errors on the part of the truck driver, a passenger vehicle driver, or other motor carrier employees. (Specific problems associated with inadequate human performance are being explored in greater depth during Phase II of the study.) However, human performance errors were often compounded by the poor mechanical condition of the vehicle.

The Board's investigation of these accidents revealed that brake system deficiencies were the most frequently encountered vehicle-related problem; the most prevalent problem was out-of-adjustment brakes. The vehicles with brake adjustment problems had from 20 to 80 percent of their brakes out of adjustment, and in 13 of the accidents, the problem of brake adjustment was compounded by other brake system problems.

Contributing to these on-the-road hazards were deficiencies in many motor carriers' maintenance programs. The Safety Board found evidence indicating that some of the carriers involved in these accidents performed little if any maintenance, including brake adjustments; other carriers adjusted brakes on their vehicles only if the driver complained. The consequences of this maintenance policy could lead to loss of life because poor brake performance probably would not be detected until high-level braking was required to avoid an accident. Many of these carriers could not provide any maintenance records for the accident vehicle.

The Safety Board's November 1988 report on this study focused on the need for automatic slack adjusters and clear carrier policies on brake maintenance and adjustment. Now that the technology for automatic slack adjusters has been sufficiently developed (some truck manufacturers now offer them as standard equipment on some models and as optional equipment on all), the Safety Board has urged the National Highway Traffic Safety Administration (NHTSA) to require them on all new trucks equipped with air/mechanical brake systems. The Board also recommended to the trucking industry that its member carriers adopt written policies regarding on-the-road brake adjustment, and provide needed training to drivers who are to be responsible for this task. To aid in performing this job well, the Safety Board recommended that carriers install air brake actuation devices that incorporate indicators to warn users when the brakes need to be adjusted.

On February 1, 1989, the American Trucking Associations responded that it would carry out the Safety Board's recommendations. On April 17, 1989, the NHTSA responded that when its multi-year research project on automatic slack adjusters is completed, it will consider whether to initiate rulemaking in this area.

The Safety Board is presently investigating selected truck accidents that involve jack-knifing during brake application (see Safety Studies section).

Heavy Truck Safety - Misuse of Diesel Engine Retarders

In the course of investigating several heavy truck accidents involving wet weather instabilities and downhill runway, the Board found repeated instances of the misuse of diesel engine retarders. In two investigations, it was clear the jackknifes resulted from the drivers' operation of their engine retarder in its maximum efficiency position. In another case, it was determined that a downhill runway accident resulted from a driver's improper shifting procedure that was in direct conflict with manufacturer's instructions. Safety Board investigation of the crash circumstances revealed that drivers were unaware of proper operating procedures for these powerful retarding devices.

While the Safety Board recognizes the safety and economic benefits that can result from the proper application and use of retarders, the Board had two areas of concern regarding the accidents investigated. First, the circumstances of those accidents indicated that the drivers were not provided with a manufacturer's operating manual by their employer. The motor carriers had not established procedures consistent with manufacturers' warnings about possible loss of control due to improper use. Second, the Safety Board was concerned that the owner's manuals of some manufacturers of engine retarders do not include information relating to single- versus twin-drive axle operational characteristics with regard to directional stability on wet surfaces with an empty trailer.

As a result of these concerns, the Safety Board made appropriate recommendations to the Federal Highway Administration, the National Highway Traffic Safety Administration, the Professional Truck Drivers Institute of America, Inc., the International Brotherhood of Teamsters, the American Trucking Associations, Inc., and the manufacturers of engine retarders. These recommendations focused on the need to provide clear operating instructions and improved driver training. In addition, the Board recommended that drivers be quizzed on their knowledge of proper retarder use through the Commercial Driver's License testing.

MARINE

Reductions in Oceangoing Vessel Manning

The Safety Board is concerned that reduced manning on U.S. vessels may increase the risk of ship accidents. With the development of automation in the design of ship systems, the manning levels aboard oceangoing vessels has been reduced significantly. The drive for smaller crews has been accelerated by the inability of major U.S. companies to compete with foreign companies that operate ships with much lower crew costs. Some ships have been authorized to reduce manpower to a level whereby the crews could possibly experience stress and fatigue, which in turn could affect the overall safety of the vessel. The ability to cope with emergencies such as fire or flooding may be severely limited on ships with reduced crews. The in-port activities such as loading, discharging, docking, and undocking limits the amount of rest that crewmembers may get before assuming navigational duties at sea.

In the recent grounding of the EXXON VALDEZ in Prince William Sound, Alaska, the vessel's third mate remained on watch beyond his normal watchstanding hours in order to give his relief some extra rest and may have contributed to the mismanagement of the navigation of the vessel. The scheduled oncoming watch officer had been involved with the loading of the tankship during the previous day, participated in the undocking and sailing, and had little chance to rest before he was scheduled to assume the watch. The reduced manpower permitted on vessels such as the EXXON VALDEZ will be examined by the Safety Board to determine the extent to which crew reductions may be affecting the safe operation of vessels.

Foreign Cruise Ship Operation out of U.S. Ports

In October 1989, the Safety Board completed a major study addressing significant safety deficiencies related to vessel maintenance, fire protection, and crew qualifications of foreign cruse ships. With the increasing numbers of foreign cruise ships carrying more U.S. citizens each year, the Safety Board is concerned that an acceptable level of safety be maintained by the cruise ship operators. Not only is the Board concerned with major issues such as fire and navigational safety, it is also concerned that foreign passenger ship crews be adequately trained to cope with shipboard emergencies. With multinational crews found aboard virtually all cruise ships, language difficulties between passengers and crew have resulted in misinterpretation of safety instructions, caused fear in many passengers when they were unable to communicate with crew members during emergencies, and generally added to the confusion when passengers became alarmed.

Foreign passenger vessels with U.S. Citizens aboard are not required to report significant vessel accidents when those accidents occur in international waters. In addition, cruise vessel operators have resisted Safety Board investigations even though there were hundreds or even thousands of U.S. Citizens aboard. Nevertheless, the Board will do its best to investigate these accidents.

Vessel Traffic Services

On March 24, 1989, the tank vessel EXXON VALDEZ grounded on Bligh Reef, Alaska, while navigating out of the Prince William Sound Traffic Separation Scheme (TSS) in an attempt to avoid ice detected by radar in the inbound/outbound traffic lanes. As a result of the grounding, all of the vessel's center and starboard cargo tanks suffered extensive damage causing about 250,000 barrels (10.5 million gallons) of North Slope crude oil to spill into the waters of Prince William Sound.

As part of the Safety Board's investigation into this accident, the operation of the Prince William Sound (PWS) Vessel Traffic Service (VTS) is being reviewed. Of particular interest to the Safety Board are: the adequacy of the statutory and regulatory requirements governing the operation of the PWS Vessel Traffic Service; the adequacy of ice reporting procedures employed by the Coast Guard in Prince William Sound; the adequacy of the training, qualification, and requalification of Coast Guard Vessel Traffic Center watchstanders; the adequacy of the manning of the Vessel Traffic Center; and, the adequacy of radar and communication equipment used to monitor tank ships transiting Prince William Sound.

An incident involving the Bahamian tankship ESSO PUERTO RICO in the Mississippi River led the Board to recommend the reestablishment of the VTS system in New Orleans. Currently, the Coast Guard is assessing the need to reestablish New Orleans VTS, as well as the need for VTS in other areas of the nation's waterways.

The Board has long recognized the contribution to vessel safety that a Vessel Traffic Service (VTS) system can provide. For this reason, the Safety Board has consistently supported the Coast Guard's vessel traffic systems wherever they are located.

Because of the magnitude of passengers at risk daily in busy ports such as New York Harbor and New Orleans, and the possibility of collisions involving oil tankships and other hazardous chemical ships in other VTS locations, the Safety Board will continue to monitor the situation to determine whether or not additional traffic services are necessary and issue appropriate recommendations to reduce the risks of accidents.

Alcohol and Marine Safety

Improvements are needed in commercial and recreational boating laws and regulations to effectively deal with alcohol/drug abuse on the Nation's waterways. Although improvements have been made in the recreational boating laws in many states to address this problem (see Safety Accomplishment Section: "Progress on State Laws on Alcohol Use in Recreational Boating"), the Safety Board believes that more can and should be done since as much as 80 percent of all recreational boating fatalities are alcohol-related.

In every State and the District of Columbia it is now illegal to operate a vessel while intoxicated. However, not all States have clearly defined blood alcohol concentrations (BACs), which establish legal intoxication, such as those existing in all States for motor vehicle drivers. In addition, not all States have laws to require a chemical test to be performed if a recreational boat operator is suspected of being intoxicated or in the event of a boating accident fatality.

The importance of comprehensive drug and alcohol rules for commercial vessel personnel is yet another focus in the Board's ongoing investigation of the EXXON VALDEZ accident. As a result of this accident, the Safety Board's concern over delayed sample collection, use of other available record checks such as motor vehicle driving records, and other concerns will be reviewed and reported.

The Safety Board will concentrate its efforts on obtaining laws in the remaining jurisdictions and will continue to stress the need for stronger Federal rules for waters where the Coast Guard has responsibility for public safety.

PIPELINE

Surveillance of Customer-owned Gas Services

On September 16, 1988, a house in Overland Park, Kansas, exploded, injuring the four residents, destroying the house, and causing substantial property damage. When the gas service line to the residence was exposed, corrosion holes were found in the customer-owned segment. That segment of the gas service line, unlike the operator-owned segment, was constructed of uncoated steel pipe and was not protected against damage from corrosion. Three other accidents, on November 25, 1988, January 7, 1989, and February 10, 1989, in the States of Missouri and Kansas, also involved bare steel customer-owned service line segments that had not been protected against damage from corrosion.

Until July 31, 1971, bare steel service lines could be installed and not be protected against corrosion. The Office of Pipeline Safety (OPS) of the U.S. Department of Transportation (DOT) estimates that there currently are more than 51 million bare, unprotected service lines in this country.

In 1979, as a result of an accident investigation, the Safety Board recommended that the DOT instruct both Federal and State pipeline inspection personnel to direct operators of gas pipeline systems to ensure that customer-owned segments of gas service lines are inspected and operated in the same manner as are operator-owned segments of service lines. On April 16, 1980, the DOT informed the Safety Board that the recommended action was being implemented.

However, from its investigations of the September 16, 1988, accident and three subsequent accidents that occurred, the Safety Board identified again that customer-owned segments of gas service lines were not being inspected and operated with the same diligence as were the operator-owned segments.

The recent series of accidents involving failures on customer-owned segments of gas service lines revealed that the safety problem involving bare steel and cathodically unprotected service lines still exists. As part of its investigation of these accidents, the Safety Board is examining the adequacy of actions taken by the gas operator to monitor the condition of these gas service lines and also the extent of Federal and State oversight of gas operators' monitoring actions.

Based on the Safety Board's findings during its investigation of these latest accidents, the Office of Pipeline Safety, DOT, at its regional chief's meeting and at two separate meetings with State pipeline safety managers held the latter part of 1988 and early 1989, again has emphasized the need to determine on a priority basis that gas operators are conducting the required gas leak detection surveys and other maintenance requirements for customer-owned portions of gas service lines.

HAZARDOUS MATERIALS

Delegation of Authority for Tank Car Standards

The Safety Board continues to be concerned about the delegation of authority by the Federal Railroad Administration (FRA) to the Association of American Railroads (AAR) for tank car standards. In its September 1987 report on the derailment and release of molten phosphorus at Miamisburg, Ohio, the Board had recommended that the FRA review its delegation of authority for tank car safety. Although the FRA began the recommended study in 1987, a final publication date has not yet been provided.

SAFETY STUDIES

Safety studies are performed to stimulate improvements in the policies, programs, activities, methods, processes, or statutory authority of Federal or State agencies, or to advance technological improvements in a transportation system, subsystem, or component.

In selecting subjects for safety studies, the Safety Board identifies ongoing or potential safety problems or issues of national significance which have one or more of the following characteristics and which can be accommodated under current personnel and scheduling limitations:

1. Potential for reducing accident losses.
2. Potential for improving the safety effectiveness of other government agencies.
3. Potential for attaining favorable action on past Board recommendations.
4. Adequacy of program resources committed by other government agencies.
5. Timeliness with regard to transportation agency program planning and implementation.
6. Potential impact on regulatory or other safety programs.
7. Congressional and public interest.

Highlights of some of the current safety studies follow:

AVIATION

Annual Reviews of Aviation Accidents

The Board publishes two reviews of aviation accident data annually -- one for general aviation and one for air carriers. Both reviews are tabular descriptions of the accidents which will compare averages for the preceding 5-year period. Accident rates will also be developed where exposure data exist.

The General Aviation Annual Review will describe accidents involving 10 categories of aircraft and 5 flight purposes in addition to providing statistics for all general aviation accidents. The Air Carrier Annual Review will provide accident statistics for three categories of air carrier revenue operations: 14 CFR Part 121, 125, and 127 operations; 14 CFR Part 135 scheduled operations; and 14 CFR Part 135 nonscheduled operations.

Statistical Review of Instructional Flying Accidents

The Safety Board will conduct a statistical review of instructional flying accidents investigated since 1983. The review will examine accident causation data as related to other accident parameters in an attempt to reveal patterns or trends for which possible solutions may be developed.

Small Turbine-powered Transport Category Airplanes

The investigation of accidents involving turbine-powered airplanes of a type used in either Part 135 or corporate/executive operations has been given special emphasis by the Board over the past several years. It is hoped that an examination of these accidents as a group will provide insights into their similarities which would not otherwise be possible. Initially, the effort will focus on Board-assigned causes and related factors. This analysis is expected to suggest areas for further review.

Light Twin-Engine Airplane Accidents Following Engine Failure

This accident data review will provide the Safety Board with an opportunity to judge the degree to which problems identified in its 1979 safety study on this topic have been solved. The analysis will center on the accident causes and related factors. It also will attempt to assess the differences in accident parameters among various aircraft models (or possibly groups of models with similar characteristics), and among groups of pilots with varying levels of experience in light twin-engine airplanes.

RAILROAD

Transport of Hazardous Materials by Rail

The Safety Board's concern over the safe movement of hazardous materials by rail has been long established. The Safety Board was the catalyst for the implementation of head shields and shelf couplers on tank cars in the late 1970s. In 1988, the Safety Board began an accident investigation program coupled with a safety study proposal to look at the issues raised by accident investigations conducted during 1988 and 1989. The Safety Board expects this study to be based on 65 or more accident investigations and interviews with major industries, associations, and other safety professionals involved in the safe movement of these materials. Some examples of issues that may be examined in the study include:

-- evacuation and other emergency response planning -- by railroads and communities as well as by shippers;

-- materials discharged during switching operations, as well as en route;

- -- requirements for car placement and train routing and timing through communities and cities;

- -- employee training and supervisor's knowledge of emergency requirements in the event of a hazardous materials release;

- -- intermodal operations such as safety requirements applicable to trailers on flatcars;

- -- emergency notification systems operations in accident situations; and

- -- industry training and hazardous materials research programs and their roles in improving hazardous materials safety.

Recently, a number of serious accidents involving hazardous materials transported by rail have occurred at such locations as Akron, Ohio; Helena, Montana; and Altoona, Iowa, and have heightened the public's attention to the transport of hazardous materials by rail. Currently, the Safety Board is compiling the data obtained from the Board's 1988 and 1989 accident investigations for use in this study.

Train Separation and Collision Avoidance

The railroad industry is moving toward improvement in train control systems. Today these systems vary from "dark territory" using train orders to maintain separation, to one railroad company that is testing an automatic train control system that uses satellite relay stations. Nevertheless, collisions between trains still occur. This study will offer the Safety Board an opportunity to examine the complete railroad system. When two trains collide, the failure could have resulted from human performance failures, effects of drugs or alcohol, or improper rules and/or dispatch; all such areas must be fully investigated.

Safety of Regional Railroads

The Safety Board's investigations of recent catastrophic accidents involving regional railroads suggest that a broad range of safety problems may be developing with the proliferation of these systems. There are currently about 90 in the United States, of which about two-thirds have been formed since 1982. In the aggregate, they embrace about 30,000 route miles of rail lines in 46 States.

On April 13, 1989, the Safety Board directed its staff to undertake a study to review the overall safety of these regional railroad systems with the project scheduled to be completed in early 1990. The principal issues to be explored in the study include:

- -- employment practices;
- -- employee screening, training, and qualification;
- -- management and supervisory oversight and testing of employees;

- inspection, maintenance capability, and practices related to tracks, bridges, signals, and rolling stock;
- adherence to accepted practices and procedures;
- train makeup, dispatching, and operating practices;
- operation of passenger trains, and equipment used therein;
- emergency response preparation and coordination; and
- FRA oversight of safety and enforcement of safety regulations on regional railroads in particular, and on the entire rail system in general.

HIGHWAY

Highway Work Zones

A 1985 survey of work zone accidents on the interstate and Federal-aid primary systems alone found that an estimated $800 million in economic losses were associated with 400 fatal accidents, 15,000 injury-only accidents, and 31,000 property damage only accidents. Although considerable effort was made in the late 1970s and early 1980s to rationalize safety practices in work zones, these efforts seem to have been diminishing since then. Work zone fatalities have increased from a conservative estimate of 500 in 1982 to nearly 700 in 1985 (latest statistics available).

The Board's Safety Study will look systematically at:

- the current standards and guidelines for work zone safety;
- the current level of training provided to the people who design traffic control procedures for work zones and those who work in these areas on a daily basis;
- the state of the art in traffic control devices for these areas;
- previous relevant accidents investigated by the Safety Board;
- FHWA monitoring and enforcement of safety standards and practices in highway work zones;
- safety management to determine contract provisions and operational policies and procedures that affect safety of work zones;
- programs and/or research that document speed considerations as they affect work zone design and safety; and
- the adequacy of work zone accident reporting and on-site investigation of work zone accidents.

On-site reviews of highway work zones, along with documentation of the traffic control procedures and devices in use (or not in use), will be performed as part of the investigation of work zone motor vehicle crashes.

Heavy Truck Safety -- Alcohol, Other Drugs, and Fatigue

In order to determine the extent of drug and alcohol use among at least a subset of heavy truck drivers, the Safety Board undertake a heavy truck safety study on October 1, 1987, focusing on fatal-to-the-truck-driver accidents. The Board performed in-depth accident investigations on 182 such accidents that occurred in the eight selected States between October 1, 1987 and September 30, 1988. The Board obtained samples for toxicology tests in as many cases as possible searching 44 different drugs or drug classes.

It appears that a higher percentage of alcohol and other drug involvement has been found than would have been expected from previous studies. The drugs of abuse most frequently found include: alcohol, cocaine, methamphetamine and amphetamine, and marijuana. The Board's final report will include both factual data on the types of drugs found and our analyses of the drug's role in accident causation. It will also include a summary analysis of fatigue involvement in these accidents.

Heavy Truck Safety -- Human Performance Factors

Several human performance issues derived from heavy truck accident investigations have been identified for further exploration and analysis. These include: an in-depth review and analysis of fatigue, circadian desynchronosis, sleep deprivation and hours-of-service relationship; driver medical condition/disability and driver physical examination; and possible over-the-counter or prescription drug involvement (for example, use of prescription drugs for cardiac problems).

Heavy Truck Cab Crashworthiness

In the course of investigating heavy truck accidents over the past 3 years, the Safety Board found that many drivers were being fatally injured due to roof collapses. The Board believes that the design of the tractor cab did not provide adequate protection for the driver. Many of those accidents involved an overturn at legal highway speed in which the tractor cab was found crushed to the level of the instrument panel, resulting in little or no survivable space for the driver. Drivers with only moderate traumatic injuries died as a result of "positional" or "compressional" asphyxiation.

The study will illustrate what the Board believes to be the structural inadequacies of the tractor cabs; the positive aspects of equipping the heavy truck fleet with improved, three-point restraint systems; and the benefits of improved rollover (roof crush) protection.

Heavy Truck Stopping Performance and Braking Related Stability

It is generally agreed that brake system adjustment has the greatest effect on stopping distances of airbraked vehicles. However, the overall performance of airbrake systems depends upon a variety of factors. A major factor influencing the stability of articulated vehicles is the application/release timing of airbrakes (the delay in time between pressure or pressure release of the foot pedal and the actual brake application/release at the shoe/drum interface). This application timing affects not only stopping distance, which can be increased dramatically, but can also be one of the primary vehicle-related factors determining the longitudinal alignment of a combination vehicle during a stopping or slowing maneuver.

The Board plans to conduct approximately 20 to 30 investigations, over a 12- to 18-month period, of heavy truck accidents involving various types of stability problems. Other issues include aftermarket equipment modification and component installation resulting in inadequate braking systems. Brake maintenance procedures also will be reviewed. An effort will be made to obtain not only the maintenance records of all involved units, but also the complete qualification and training records of any person responsible for the units' maintenance.

This study will enable the Board to graphically illustrate problems resulting from manufacturing incompatibilities, review Federal standards that apply to application timing, and highlight deficiencies resulting from improper maintenance. The Board will also attempt to address the advantages/disadvantages of anti-lock systems.

MAJOR PROGRAM DESCRIPTIONS

This section provides descriptions of the major programs of the Board. Included is a detailed analysis of the staffing depth in each organization.

POLICY AND DIRECTION

Policy and direction at the Safety Board is provided by the Offices of the Chairman, Vice Chairman, and Members of the Board, assisted by the Office of the Managing Director, the Offices of Government and Public Affairs, and the Office of the General Counsel.

1. Policy Development - To carry out the duties and responsibilities of the Board as prescribed in the Independent Safety Board Act of 1974, the Board Members establish policy on transportation safety issues and problems and on Board goals, objectives, and operations; review and approve all Board reports and safety recommendations; provide the second level of appeal of FAA certificate actions; preside over all public hearings; testify before Congressional committees; and act as spokespersons to the transportation industry, other government agencies, and the public.

2. Management - To ensure the effective implementation of the Board's programs, the Office of the Managing Director coordinates and directs the day-to-day operations of the staff; schedules and manages the Board's review of major reports; and provides executive secretariat services to the Board.

3. Government Liaison and Public Information - To keep the public, Congress, and other government agencies informed on the work of the Board and its efforts to improve transportation safety, the Offices of Government and Public Affairs answer oral and written inquiries from the Congress, the public, the news media, and the transportation industry; prepare testimony for Board participation in Congressional hearings; represent the Board at major accident sites; and generally attempt to improve the dissemination of safety information and increase public awareness of the Board's activities in transportation safety.

4. Legal Services - The Office of the General Counsel provides internal advice and assistance on legal aspects of policy matters, legislation, Board rules, and other matters of legal significance; ensures timely and objective review of airman and seaman certificate and license appeals; and represents the Board in court proceedings.

STAFFING DEPTH IN VARIOUS SPECIALTIES
FYs 1989 - 1991

POLICY & DIRECTION	FY 1989	CHANGE	FY 1990	CHANGE	FY 1991
Board Members/Staff	15	0	15	0	15
Editors	1	0	1	0	1
Public Affairs Specialists	4	0	4	0	4
Govt. Affairs Assistant	1	0	1	0	1
Attorneys - General	1	0	1	0	1
Attorneys - Appeals	3	0	3	2	5
Paralegal/Legal Technician	0	0	0	0	0
Supervisory	4	0	4	0	4
Administrative/Clerical	5	0	5	0	5
Total	34	0	34	2	36

ACCIDENT INVESTIGATION

The Bureaus of Accident Investigation and Field Operations investigate or cause to be investigated all aviation and selected surface transportation accidents and incidents, develop proposed probable cause(s) of accidents, formulate recommendations to minimize their recurrence, and prepare detailed reports for use by other government agencies, the Congress, the transportation industry and the traveling public.

Bureau of Accident Investigation

The Bureau of Accident Investigation manages the investigations of major transportation accidents -- those accidents for which multi-disciplinary teams (go-teams) are sent to the accident site.

The staff of the Bureau is located in the Washington headquarters, and is comprised of five divisions -- Aviation, Marine, Railroad, Highway, and Pipeline/Hazardous Materials. These divisions provide the team leaders (Investigators-In-Charge) for the "go-teams" that investigate major accidents and selected incidents. These divisions also prepare the Safety Board's comprehensive accident reports.

When the Safety Board is notified of a major accident, it launches a "go-team" which varies in size depending upon the severity of the accident and the complexity of the issues involved. The team consists of experts in as many as 14 different specialties, including materials analysis, operational and environmental factors, systems design and support, human performance, and survival factors. Each expert manages other experts from industry and government in the collection of the facts, conditions, and circumstances surrounding the accident. The participation of other "parties" greatly multiplies the Board's resources and ensures general agreement over the findings of the investigation. The parties' participation also allows first-hand access to information so that appropriate corrective actions may be taken by the parties.

A public hearing may be convened, or depositions may be taken, to gather additional factual information in connection with an investigation. After the investigation is complete, a detailed narrative report, which analyzes the investigation record and which identifies the probable cause(s) of the accident, is then prepared. A major investigation takes anywhere from six months to a year to complete. Safety recommendations emanating from the major investigations are generally included in the final accident report. However, when appropriate, safety recommendations may be issued at any time during the course of an investigation.

The Bureau's Aviation Division also provides the accredited representative for the investigation of civil aviation accidents occurring in other countries. The accredited representative serves as the U.S. representative and assists foreign governments in their accident investigations in accordance with international treaties. The accredited representative informs domestic aviation interests of the progress of an investigation, while providing needed technical expertise, as requested, to foreign governments. Safety issues that are uncovered during such investigations that may adversely affect U.S. aviation safety or the safety of aircraft, or aircraft components manufactured in the U.S., are brought to the attention of the FAA and U.S. industry representatives.

Bureau of Field Operations

The Bureau of Field Operations consists of aviation, railroad, and highway investigators located in the Board's Washington, D.C. headquarters and 10 regional offices in major cities across the United States. The Bureau manages the investigation of smaller-scale accidents that usually are investigated by one person or a partial team from the Safety Board. The Bureau currently investigates approximately 3,000 accidents and incidents annually.

1. Field Investigations. Aviation, railroad, and highway accidents/incidents meeting the Board's accident selection criteria are investigated as "field" accident/incident investigations. They are conducted in a manner similar to a major investigation, but because the investigation is usually much smaller in scope, it often is conducted by a single investigator, who, working with representatives from other parties, gathers all of the detailed information pertinent to the accident. During each investigation, investigators must always consider ways to prevent similar types of accidents from recurring through an informal on-scene recommended solution or through the Board's formal safety recommendation process. In addition, field investigators provide support to all major accidents which occur in the geographic (several state) area of the regional office. Many of the highway accidents are investigated in support of one or more of the Board's several safety studies.

2. Limited Investigations. "Limited" investigations generally are conducted for aviation accidents in which the aircraft is substantially damaged or destroyed, and there are no fatalities. "Limited" investigators and investigative assistants are sometimes required to assist aviation field investigators with the on-scene or followup phase of an investigation.

3. Report Analysis. Analysts in the Bureau's Investigation and Analysis Division located in the Washington headquarters are responsible for reviewing the standardized accident forms and narrative reports prepared by the regional investigators for the public record of the investigation. Computer "brief" reports containing relevant facts, findings, and probable cause(s) and factors are prepared for all field and limited investigations, and summary narrative reports are prepared for selected cases. The data from all investigations are maintained to identify trends, assess program effectiveness, provide statistical support for Safety Board studies and safety recommendations, and support other related safety purposes.

STAFFING DEPTH IN VARIOUS SPECIALTIES
FYs 1989 - 1991

MAJOR INVESTIGATIONS	FY 1989	CHANGE	FY 1990	CHANGE	FY 1991
AVIATION					
IIC	6	0	6	2	8
Accident Assistant	1	0	1	0	1
Railroad IIC	4	0	4	1	5
Highway IIC	4	0	4	1	5
Marine IIC	8	0	8	0	8
Pipeline IIC	2	0	2	0	2
Haz Mat IIC	3	0	3	0	3
Technical Writers	2	0	2	1	3
Editors	0	0	0	0	0
Supervisory	7	0	7	0	7
Administrative/Clerical	6	0	6	0	6
Total	43	0	43	5	48
FIELD INVESTIGATIONS:*					
Air Safety Investigator	38	0	38	2	40
Air Safety Investigator (Limited)	6	0	6	0	6
Investigative Assistant	3	0	3	0	3
Air Safty Investigator (Analysis)	5	0	5	0	5
Railroad Safety Investigator	10	0	10	1	11
Railroad Program Coordinator	1	0	1	0	1
Railroad Quality Assurance	1	0	1	0	1
Highway Safety Investigator	14	0	14	1	15
Highway Program Coordinator	1	0	1	0	1
Data Input (Aviation)	3	0	3	0	3
Supervisory	13	0	13	0	13
Administrative/Clerical	14	0	14	0	14
Total	109	0	109	4	113

*Staff covers Washington headquarters and 10 regional locations.

TECHNOLOGY

The Bureau of Technology provides group chairmen in as many as 14 technical specialty areas for major accident investigations in all modes of transportation. The group chairmen coordinate the efforts of participants in the accident investigations provided by industry and other government agencies under the direction of the Investigator-In-Charge (IIC). Each group conducts an accurate, objective, and thorough technical investigation of the accident and produces separate factual and analytical reports which are incorporated into the final Board report on the accident. The reports are likely to include proposed safety recommendations to correct deficiencies found and prevent future accidents from similar causes. In addition to major investigations, the Bureau also provides technical support to the Board's field investigation program, including the development of safety recommendations, and to safety studies developed in the Bureau of Safety Programs.

Below is a description of each specialty area for which the Bureau provides technical investigative support:

1. Air Traffic Control (ATC). Examines ATC facilities, procedures, and flight handling including ground to air voice transmissions and develops flight histories from Air Route Traffic Control Center and terminal facility radar records.

2. Maintenance Records. Examines the service history, and maintenance of aircraft systems, structures, and powerplants.

3. Aircraft Performance. Uses advanced computer technology to examine the performance characteristics of vehicles in accidents, including three-dimensional vehicular performance studies and complex analytical studies in vehicle dynamics and operation.

4. Cockpit Voice Recorders. Examines recorded electronic information in the form of radio, video, and recorded electronic communications in aircraft, ships, trains, and automobiles and their supporting systems.

5. Flight Data Recorders. Extracts, formats, and analyzes data from digital and mechanical aircraft flight recorders and recorders installed in locomotives, large ships and some highway vehicles.

6. Operations. Examines operational factors involved in the flight operations of the carrier and the airport, and in the flight training and experience of the flightcrew.

7. Power Plants. Examines the airworthiness of aircraft engines.

8. Structures. Examines the integrity of aircraft structures and flight controls including the adequacy of design and certification.

9. Systems. Examines the airworthiness of aircraft flight controls, and electrical, hydraulic, and avionic systems in aviation accidents.

10. Surface Engineering. Examines vehicular, operational, and environmental factors in the highway, railroad, and marine transportation modes including: (a) motor vehicle mechanical and structural systems; (b) highway civil engineering and roadway geometrics; (c) highway motor carrier operations; (d) railroad vehicle mechanical, electrical and structural systems; (e) railroad track and structures engineering, communications, and signaling; and (f) marine vessel design and structural integrity.

11. Human Performance. Examines the performance of persons whose actions may have caused or contributed to the occurrence of an accident in all transportation modes including the person's knowledge, experience, training and physical abilities; the adequacy of established procedures; work habit patterns and the interrelationships with management; the equipment design, and operator-equipment interaction dynamics (ergonomics); and the environment as it may affect the person's ability to sense and perform.

12. Materials Analysis. Provides materials engineering support for all modes of transportation in areas such as: (a) fracture, deformation, and failure analysis; (b) chemical composition and strength of materials; (c) stress, strain, and local distribution analysis; (d) design, fabrication, and testing of components; (e) in-service and recurrent nondestructive testing; (f) fatigue, overstress, corrosion, corrosion fatigue, stress corrosion, embrittlement, and elevated and low temperature failures; (g) friction, rolling contact, and wear failures; (h) impact and crash reconstruction; (i) instrument and system component inspection, teardown, and analysis; and (j) fire and explosion effects.

13. Survival Factors. Examines factors that affect the survival of persons involved in accidents in all transportation modes including the cause of injuries sustained by occupants of the vehicle involved or other affected persons. Also, examines safety procedures, vehicle crashworthiness, equipment design, and emergency responsiveness.

14. Weather. Examines the meteorological/environmental conditions affecting accidents in all modes of transportation.

STAFFING DEPTH IN VARIOUS SPECIALTIES
FYs 1989 - 1991

TECHNOLOGY	FY 1989	CHANGE	FY 1990	CHANGE	FY 1991
AVIATION					
Air Traffic Control	4	0	4	1	5
Aircraft Maint. Records	1	0	1	0	1
Aircraft Performance	2	0	2	1	3
Aviatn Engineerng Supprt	2	0	2	0	2
Cockpit Voice Recorder	2	0	2	0	2
Flight Data Recorder	1	1	2	1	3
Helicopters	1	0	1	1	2

STAFFING DEPTH IN VARIOUS SPECIALTIES (continued)
FYs 1989 - 1991

TECHNOLOGY	FY 1989	CHANGE	FY 1990	CHANGE	FY 1991
AVIATION (continued)					
General Aviation Spec.	1	0	1	1	2
Operations	3	0	3	0	3
Power Plants	3	0	3	0	3
Structures	1	1	2	1	3
Systems - Avionics/Hydraulic	2	0	2	1	3
Systems - Electrical	1	0	1	1	2
Human Performance	4	0	4	0	4
Survival Factors					
General	1	0	1	0	1
Crashworthiness	0	0	0	0	0
Cabin Safety	1	0	1	0	1
Crash/Fire/Rescue	1	0	1	0	1
RAILROAD					
Track Structure/Dynamics	0	0	0	1	1
Electrical Engineering	1	0	1	0	1
Operations	1	0	1	0	1
Mechanical Engineering	1	0	1	0	1
Human Performance	1	0	1	0	1
Survival Factors	0	0	0	0	0
HIGHWAY					
Bridge Engineering	1	0	1	0	1
Highway Engineering	1	0	1	0	1
Operations	1	0	1	0	1
Automotive Engineering	1	0	1	0	1
Human Performance	2	0	2	0	2
Survival Factors					
Crash/Injury	1	0	1	0	1
Accident Reconstruction	3	0	3	0	3
MARINE					
Marine Engineering	1	0	1	0	1
Naval Architecture	1	0	1	0	1
Human Performance	1	0	1	0	1
Survival Factors	0	0	0	0	0
CROSSMODAL					
Metallurgy	3	0	3	0	3
Materials Analysis	1	0	1	0	1
Chemist	1	0	1	0	1
Weather	2	0	2	0	2
Human Perf.-HazMat/Pipeline	0	0	0	0	0
Survival Factors					
HazMat Emergncy Response	1	0	1	0	1
Fire/Explosions	0	0	0	0	0
General (Assistant)	1	0	1	0	1
Supervisory	9	0	9	0	9
Administrative/Clerical	9	0	9	0	9
Total	75	2	77	9	86

SAFETY PROGRAMS

The Bureau of Safety Programs conducts oversight studies of the safety activities of other transportation agencies and the transportation system. It manages the development and followup of the Safety Board's safety recommendations and the Board's comments on Notices of Proposed Rulemaking. It also maintains the Board's transportation accident and incident data system. The purpose of this organization is to identify and propose solutions to transportation safety problems.

The process involves four main activities:

1. Safety Studies. The Bureau evaluates the safety effectiveness of Federal, State, local, and industry transportation safety programs by exploring policy issues, program coverage, and management effectiveness. Studies are also conducted of major transportation issues by analyzing accident data derived from past accidents or special investigations, by analyzing accident statistics, and by studying transportation systems or subsystems to identify and define safety problems. In all cases, comprehensive reports containing recommendations for corrective action are prepared for public release.

2. Safety Recommendations. Recommendations are vital to the Board's basic role of accident prevention. This program ensures that the Board issues appropriate and effective recommendations for enhancing safety in all transportation modes and is designed to increase the degree of acceptance by recipients of Board recommendations and to expedite corrective action. The Bureau's management of the safety recommendation program extends to ensuring that recommendations are appropriate, clearly written, concise, and well-supported by demonstrated need.

3. Accident Data. Accessible, good quality data are essential to pinpointing areas of safety need, developing insight into the best potential solutions, monitoring the effectiveness of tried countermeasures, and reviewing the progress of safety efforts. This program involves the retrieval, analysis, and dissemination of aviation accident data. The Bureau provides statistical analyses and disseminates accident data in regularly published standard reports and in ad hoc reports on special safety issues to other Board program managers, Members of Congress, the public, industry, other government agencies, foreign governments, and others.

4. Rulemaking Comments. Federal rulemaking actions can be among the most significant influences on transportation safety. Rulemaking is most useful when it is directed toward well-defined problems and when it provides for careful evaluation of the real-world effectiveness of the regulatory action. This program ensures that the Safety Board constructively influences the development of effective regulations and the reduction of duplicative, outmoded, or otherwise ineffective rules. The Bureau is responsible for monitoring all DOT rulemaking actions and managing the preparation of timely, informed comments on those rulemakings which relate to major policy issues of concern to the Board.

STAFFING DEPTH IN VARIOUS SPECIALTIES
FYs 1989 - 1991

SAFETY PROGRAMS	FY 1989	CHANGE	FY 1990	CHANGE	FY 1991
Safety Studies					
Aviation	0	0	0	0	0
Railroad	1	0	1	0	1
Highway	1	0	1	0	1
Marine	1	0	1	0	1
Crossmodal (Alcohol/Drugs)	1	0	1	0	1
Rulemaking Review	1	0	1	0	1
Recommendations					
Aviation	2	0	2	0	2
Railroad	0	0	0	0	0
Highway	1	0	1	0	1
Marine/Haz Mat/Pipeline	1	0	1	0	1
Computer Assistant	1	0	1	0	1
Accident Data					
Statistician	1	0	1	0	1
Aviation Analyst	1	0	1	0	1
Accident Data Specialist	2	0	2	0	2
Accident Data Assistant	1	0	1	0	1
Supervisory	4	0	4	0	4
Administrative/Clerical	4	0	4	0	4
Total	23	0	23	0	23

ADMINISTRATION

The Bureau of Administration is responsible for providing timely, responsive administrative support and services to the Safety Board and the public in the areas of financial management, personnel and training management, operations and facilities management, and automated information management.

1. Financial Management. The purpose of this activity is to obtain sufficient resources from the Congress to operate the Board's programs, to ensure Board funds are properly spent and properly controlled, and to maximize the efficient and effective use of Board funds.

   To accomplish this the financial management staff must develop, prepare, and coordinate annual budget requests and triennial authorization requests to OMB and Congress; evaluate program operations; conduct financial reviews to maintain positive control over appropriated funds and ensure funds are expended in accordance with approved programs; control personnel resources; develop and maintain an accounting system that provides accountability for expended resources and furnishes timely external and internal financial management reports; audit and certify bills and vouchers for payment; and conduct financial and program audits of Board functions.

2. Personnel and Training Management. The purpose of this activity is to effectively manage the personnel and training program to improve productivity and morale, to maintain compliance with Federal laws and regulations, and to maintain a highly skilled and efficient workforce.

   To accomplish this the personnel and training staff must recruit and process applications for all vacant positions; process personnel actions for all hires, promotions, and salary adjustments; provide employees with employee services and benefit information, including counseling in such areas as life and health insurance coverage and retirement benefits; review and classify positions to maintain an accurate grade and position structure; develop and implement personnel and training programs, such as performance appraisal systems and incentive award programs; and manage the training program.

3. Operations and Facilities Management. The purpose of this activity is to manage the contracting, facilities, printing, mail services, and public inquiries functions.

   To accomplish this the operations and facilities staff must provide and maintain the staff working environment and the Board's accountable property; procure and contract for needed goods and services; coordinate the provision of printing, graphics, and photographic services; coordinate and/or provide internal and external mail and messenger service; maintain the files on major Board products and provide or coordinate the provision of file information and Board publications to the public.

4. Automated Information Management. The purpose of this activity is to provide information processing support for the Board's automated systems.

To accomplish this the information management staff must manage all mainframe and microcomputer hardware and software programs, including providing user support and training, providing enhancements for current programs, and developing new programs which support the following applications: aviation accident data, railroad accident data, safety recommendations, accounting and budgeting, staffing control, correspondence tracking, inventory control, mailing lists, word processing, and project management.

STAFFING DEPTH IN VARIOUS SPECIALTIES
FYs 1989 - 1991

ADMINISTRATION	FY 1989	CHANGE	FY 1990	CHANGE	FY 1991
Budget Officer	1	0	1	0	1
Budget Analyst	1	0	1	0	1
Accounting Officer	1	0	1	0	1
Accountant	1	0	1	0	1
Financial Specialist	1	0	1	0	1
Accounting Technician	2	0	2	0	2
Personnel - Classification	1	0	1	0	1
Personnel - Staffing	1	0	1	0	1
Personnel - Empl. Dev./Relations	1	0	1	0	1
Personnel - Operations (Asst)	1	0	1	0	1
Contract Specialist	1	0	1	0	1
Facilities Assistant	1	0	1	0	1
Office Services Assistant	1	0	1	0	1
Printing Specialist	1	0	1	0	1
Mail Clerk	1	0	1	0	1
Records Mgmt. Officer	1	0	1	0	1
Archives Technician	2	0	2	0	2
Computer Systems Analysts	1	0	1	0	1
Computer Specialists	1	0	1	0	1
Computer Assistant	1	0	1	0	1
Supervisory	5	0	5	0	5
Administrative/Clerical	3	0	3	0	3
Total	30	0	30	0	30

ADMINISTRATIVE LAW JUDGES

The Safety Board serves as the "court of appeal" for any airman whenever certificate action is taken by the Administrator of the Federal Aviation Administration (FAA).

Under the Independent Safety Board Act of 1974, the Board's Administrative Law Judges hear, consider, and issue initial decisions on appeals from FAA certificate actions taken under Section 602(b), 609, and 501(c) of the Federal Aviation Act of 1958, as amended. Judges' decisions may be appealed to the five-member Board by the airman or the FAA.

The Board's review of the appeal encompasses the transcripts of the proceeding, the Judge's decision, and appeal briefs submitted by the parties.

Under the Equal Access to Justice Act of 1980, as amended (EAJA), the Judges also review and decide applications for attorney fees and expenses from airmen who prevail against the FAA in the adversary adjudications brought pursuant to Section 609 of the Federal Aviation Act of 1958, as amended.

The final decision of the full Board is subject to judicial review by the U.S. Court of Appeals pursuant to Section 1006 of the Federal Aviation Act of 1958, as amended. However, the right of appeal to the U.S. Court of Appeals is only extended or granted to the airman, not to the FAA. Upon review, the Court has the power to affirm, modify, or set aside the full Board's Opinions and Orders, in whole or in part; and if necessary, to order further proceedings by the Board. The judgment and decree of the Court of Appeals is subject to review by the Supreme Court of the United States.

STAFFING DEPTH IN VARIOUS SPECIALTIES
FYs 1989 - 1991

ADMINISTRATIVE LAW JUDGES	FY 1989	CHANGE	FY 1990	CHANGE	FY 1991
Judges	6	0	6	1	7
Paralegal/Legal Technician	1	0	1	0	1
Administrative/Clerical	3	0	3	1	4
Total	10	0	10	2	12

THE ROLE OF THE SAFETY BOARD AND OTHER ORGANIZATIONS IN TRANSPORTATION SAFETY

The purpose of this section is to describe the accident investigation role of various organizations involved in transportation safety. Within the transportation community, each organization has been established to fulfill a unique role, and, thus, views its accident investigation function from a different perspective. Therefore, each agency investigates accidents to varying degrees of depth and with a different goal in mind. For example, the Safety Board, as the only organization whose primary purpose is promoting transportation safety, conducts very detailed and thorough accident investigations, which often uncover significant systemwide problems that must be corrected in order to prevent future similar accidents. Recommended solutions to correct these problems are proposed to other government agencies and/or industry for implementation. The Safety Board has no authority to regulate nor is it directly involved in the operation of any mode of transportation. Therefore, it has the unique ability to oversee the transportation system from a totally objective viewpoint and to make recommendations for needed safety improvements without deference to existing policies or regulations. The investigative approach of other organizations, whose primary functions do involve both the regulation and the operation of a transportation subsystem, serves the specific purpose, as described in the paragraphs that follow, for which they were established. In general, their investigative role differs from that of the Safety Board in that:

- other agencies investigations generally focus their efforts in a manner that will facilitate their enforcement responsibilities, such as determining if a shipper, carrier, or manufacturer has violated existing regulations, rather than on possible changes to regulations that may be needed to prevent similar accidents;
- the persons who conduct the investigations for these organizations, often are not specifically trained (or have very limited training) in accident investigation, while the Board's staff is uniquely qualified to investigate accidents;
- the investigations often are narrow in scope or are conducted for data collection or statistical analysis only, and, therefore, cannot be used as a basis for safety improvement recommendations;
- unlike the Safety Board, these organizations do not have a formal safety recommendation process which includes disseminating information and recommendations to other agencies or industry groups whose actions are necessary to effect the recommended safety improvements; and
- the results of other agencies' investigations generally are not published, while the Safety Board issues reports on all accidents for which it determines a probable cause.

Moreover, the Safety Board's approach goes beyond the statistics and beyond establishing fault to examining all factors which led to an accident or incident to ensure that those agencies whose role it is to establish transportation policies and regulations are provided with a thorough and objective analysis of both actual and potential deficiencies in the transportation system, as well as proposed solutions to correct these deficiencies.

The National Transportation Safety Board

The National Transportation Safety Board is an independent agency charged with determining the probable cause(s) of transportation accidents and promoting transportation safety. The Board investigates accidents, conducts safety studies, evaluates the effectiveness of other government agencies' programs for preventing transportation accidents, and reviews appeals of adverse actions by the Administrators of agencies of the Department of Transportation involving airman and seaman certificates and licenses.

Most importantly, the Board makes safety recommendations, based on its investigations and studies, to Federal, State and local government agencies and to the transportation industry regarding actions that should be taken to prevent accidents. Safety recommendations are the focal point of the Board's efforts to improve safety in the transportation system.

Historical Perspective

The Board's origins can be found in the Air Commerce Act of 1926, in which Congress charged the Commerce Department with investigating the causes of aircraft accidents. This responsibility fell under the Bureau of Aviation Safety within the Civil Aeronautics Board. In 1966, Congress consolidated transportation agencies into the U.S. Department of Transportation (DOT) and also created the National Transportation Safety Board (NTSB) within the DOT. In establishing the Board, the Congress believed that the NTSB would develop a higher degree of safety than separate safety functions in each mode could achieve. Since 1967 the Board has investigated accidents in all modes of transportation including aviation, highway, marine, rail, and pipeline.

However, in 1974, the Congress made the Board independent of the DOT saying: "No Federal agency can properly perform such functions unless it is totally separate and independent from any other . . . Agency of the United States." Because the DOT is charged with both the operation and the safety of the U.S. Transportation system, and because accidents suggest deficiencies in this system, the Safety Board's independent investigative role is essential to the Board satisfying the public's demand for objective oversight of this system.

In order to maintain its objectivity, the Board was not given the authority to regulate the transportation industry. Its effectiveness, therefore, depends on its reputation for timely and accurate determination of the cause of accidents and for issuing realistic and feasible safety recommendations.

The most visible portion of the Safety Board's accident investigation role involves the management of major accident investigations. The investigations include the participation of DOT modal agencies and other "parties to the investigations" (vehicle and component manufacturers, operators, employee unions, and State and local government agencies). Such parties to an investigation may have specific conflicts of interest, which prevent them from being totally objective during an investigation. The Safety Board, however, has no conflict of interest, and thereby maintains its objectivity as it manages the experts and parties to ensure a thorough, open, and complete investigation.

AVIATION

The Federal Aviation Administration

The FAA has about 2,200 general aviation and air carrier inspectors who, in addition to their inspection duties, investigate about 10 percent of the general aviation accidents. These investigations primarily consist of agricultural, homebuilt, and experimental aircraft, and some selected accidents not meeting the Board's selection criteria.

Prior to 1982, the Safety Board delegated about 75 percent of all aviation accidents to the FAA but found this procedure unsatisfactory. Because of the enforcement focus of the FAA's investigations, the Board found it necessary to collect additional safety-related information in order to determine the cause of the accident. The FAA investigations were focused on finding operator violations, sometimes at the expense of the inspectors' objectivity. As operations and maintenance inspectors, their primary duties are aircraft and operations inspections, airman testing and certification, and pilot education. Accident investigation is not a major, much less a full-time, assignment for these inspectors. Finally, not all of the FAA inspectors have been trained in accident investigation; for those who have, necessary refresher training has been nearly nonexistent. For this reason, in 1982, the Board significantly reduced the number of accidents it delegated to the FAA.

The Safety Board's Role in Aviation Accident Investigation

The Federal Aviation Act of 1958 and the Independent Safety Board Act of 1974 placed the responsibility for investigating all U.S. Civil aviation accidents/incidents and determining the probable cause with the Safety Board. The Safety Board may delegate the actual investigation of the accident but is still responsible for determining the probable cause.

In addition, the Board is charged to carry out studies, special investigations, evaluations, and assessments of matters pertaining to aviation safety, including human injury avoidance, other agencies' aviation safety consciousness and efficacy in preventing aviation accidents, and the adequacy of safeguards and procedures for transporting hazardous materials by air.

Because of the international nature of the world's aviation industry and the leading role of the U.S. In the technological progress of aviation, the Safety Board's role in the investigation of domestic and international aviation accidents is essential to the enhancement of worldwide airline safety for all persons who travel by air. In fact, the worldwide public reaction to any major air disaster has an adverse effect on U.S. airlines and the confidence of U.S. Citizens in the safety of airlines in general.

Further, the Board is charged with fulfilling the U.S. Obligations for international aviation accident investigations established by the International Civil Aviation Organization treaty. As such, the Safety Board appoints a leader (U.S. Accredited Representative) of the U.S. Team who participates in the investigation of major accidents overseas. These accidents include U.S. Airline accidents on foreign territory and accidents involving U.S.-manufactured aircraft operated by foreign airlines overseas. Because the United States maintains a reputation as the world leader in aviation safety, many other governments and aircraft industry representatives look to the Safety Board for the results of its investigations and safety recommendations. The Board's major aviation accident reports, safety recommendations, and accident statistics are disseminated worldwide and have a direct influence on the safety of foreign airlines.

A less visible portion of the Safety Board's aviation accident investigation role involves the investigation of noncatastrophic and general aviation accidents. These accidents involve specific issues of special concern to the Board, i.e., air carrier and other large aircraft accidents; fatal and serious injury commuter and air taxi accidents; midair collisions; in-flight breakup or in-flight fire accidents; accidents involving newly certificated aircraft; accidents involving high performance turbine-powered airplanes; and accidents implicating air traffic control services, facilities, or procedures. The Safety Board also investigates accidents involving property damage only, in which a relatively limited investigation suffices for data purposes. Further, the investigation of selected incidents not meeting the definition of an accident often provides valuable prevention measures to preclude a serious accident from occurring.

RAILROAD

Federal Railroad Administration

The Federal Railroad Administration (FRA) investigates about 200 accidents and collects data on the remaining 6,500 accidents reported to it annually. The accidents FRA investigates primarily involve the death of a rail employee or the injury of five or more people. The reporting criteria include grade crossing collisions, damage to rail equipment exceeding $5,700, or death or injury to people. These reporting requirements also preempt States from requiring railroads to file duplicative written accident reports to State officials.

The FRA has 330 inspectors from various technical disciplines who may investigate accidents. They are trained for accident investigation through a 1-week course at the DOT's Transportation Safety Institute.

Railroad Accident Investigation by the States

The States participate with the FRA in enforcing Federal standards on track, signal, and train control, motive power and equipment, and operating practices. The States' programs vary in size and scope depending on the number and importance of the railroads in the individual State and the funding support provided by the legislature. In the past, railroad enforcement programs in 30 States were funded through a 50 percent State/50 percent Federal grant arrangement. The FRA no longer funds this program.

The Safety Board's Role in Railroad Accident Investigation

Since 1966, the primary responsibility for railroad accident investigation has been assigned by Congress to the Safety Board. The Board performs in-depth analyses of selected rail accidents involving a fatality, substantial property damage, the transport of hazardous materials, or a passenger train. The Safety Board determines the probable cause(s), and issues recommendations to effect changes to prevent similar accidents.

The Board also conducts safety studies of significant railroad safety issues often based on a set of accident investigations specifically undertaken as the basis for the study. In other cases, safety studies may be based on an analysis of regulations, railroad safety programs and procedures, audit reviews of management and operational practices, or similar research approaches. In addition, the Board investigates selected accidents which concern specific accident prevention issues.

Because of its limited resources, the Board is only able to investigate about 170 of the 6,500 accidents/incidents which are reported each year to the FRA.

HIGHWAY

Accident Investigation and Data Collection by the National Highway Traffic Safety Administration

The National Highway Traffic Safety Administration's (NHTSA) accident investigation role is fulfilled primarily through its data collection efforts. As part of these efforts, NHTSA, in 1979, established the National Accident Sampling System (NASS) program to collect nationally representative motor vehicle accident data, on both fatal and nonfatal accidents, through the investigation of a statistically valid sample of traffic accidents by NASS teams located across the country.

The NASS program is complemented by the Fatal Accident Reporting System (FARS), through which NHTSA collects less detailed information from police reports on all fatal accidents in the United States. The FARS data base, regarded as a census of all fatal accidents, is a completely uncorrected police-reported data base and therefore, contains all the uncertainties and inaccuracies associated with this type of data. This concern with the accuracy of the data collected, particularly occupant protection data, prompted the NHTSA in 1988 to establish two new data collection activities.

The Crashworthiness Data System (CDS) is one of the new sampling systems, which will collect data relevant only to the crashworthiness of passenger cars, light trucks, and vans. No data will be collected on heavy trucks, motorcycles, or pedestrian fatalities, except when these vehicles are involved with vehicles meeting the selection criteria. NHTSA's goal is to establish 36 sites (in 18 States), and collect data on 6,500 accidents (700 fatal crashes, 1,500 fatalities/serious injuries and 3,000 to 4,000 towaway accidents with moderate or less injuries). The new CDS sample clearly will be less of a multipurpose data file than was the old NASS program.

The General Estimates System (GES), the second of these new accident sampling systems, will be similar to the FARS and the NASS databases, but will collect data on a wider range of vehicles and will not be limited to fatal accidents. NHTSA's goal for the GES program is to collect data from a sample of police reports involving 45,000 accidents. The data will be collected at the 36 NASS crashworthiness sites and 24 additional sites (in all, 60 sites in 24 States).

Accident Investigation by the Office of Motor Carriers

In fiscal year 1986, over 26,000 truck/bus accidents were reported. Of those, the Office of Motor Carriers (OMC) conducted 39 accident investigations and 91 hazardous materials incident investigations. Commercial vehicle accidents investigated by the OMC include but are not limited to: an accident resulting in multiple fatalities, numerous injuries, substantial property damage, or a combination thereof; an accident resulting in death or serious injury to school children; or an accident likely to result in widespread public interest, and of which detailed knowledge would be beneficial.

The major benefits attributed to the OMC accident investigation function are support for the OMC enforcement program, identification and correction of safety problems, and identification of the need for new safety regulations or improvements in existing regulations.

Highway Accident Investigation and Data Collection by State or Local Agencies

State and local police historically have investigated a large number of highway accidents, particularly those in which one or more persons are killed. However, police investigations traditionally have been directed at determining "culpability," and collecting specific sets of facts for law enforcement and damage claim purposes which are not suitable for highway research. In most States, data collection and analysis is both inadequate and inaccurate for sound safety improvement planning and evaluation. Data for vehicle crashworthiness issues in particular are lacking. Other deficiencies include:

- incomplete data bases (e.g., 55 percent of persons treated at hospital emergency rooms were not included in police reports);
- restraint status inaccuracies (incorrect and overstated reports of belt use, and type of restraint used. The problem has worsened with advent of seat belt use laws);
- uncertainties about injury severity;
- lack of injury source information; and
- uncertainties about crash severity.

The Safety Board's Role in Highway Accident Investigation

The Safety Board is responsible for the investigation and reporting of highway accidents, including railroad grade crossing accidents, that it selects in cooperation with the States. The Board devotes its limited highway investigation resources to accidents that have a significant impact on the public's confidence in highway safety, generate high media and/or public interest, or that concern technical safety issues which cause or contribute to injuries on a national scale and are correctable.

The objectives of the Board's highway program are carried out through (1) the multidisciplinary, in-depth investigation of catastrophic accidents involving multiple fatalities, (2) field-level investigations conducted in support of selected highway safety issues, and (3) special investigations concerning a predetermined subject selected in support of a safety study. As in other modes, the end result of these highway efforts are actions taken by Federal, State, or local agencies, or industry, often emanating from specific Safety Board recommendations to reduce the likelihood or recurrence of transportation accidents and to make the transportation of persons and property as safe and free from the risk of injury and damage as is possible.

MARINE

Accident Investigation by the Coast Guard

The Coast Guard has the authority to investigate commercial vessel accidents which occur in U.S. Waters or involve U.S. Vessels. Although most Coast Guard investigations are informal in nature, the agency occasionally convenes a one-person formal investigation or a formal Marine Board of Investigation. A Marine Board of Investigation is undertaken only in the most serious major marine accidents. Safety Board investigators normally participate in both types of formal investigations. Currently, the Coast Guard's accident investigation program is supported by only 37 field investigating officer billets, a significant reduction from the number which supported this function previously. Because its staff was reduced even though the number of major accidents remained fairly constant during the past 10 years, the Coast Guard has been forced to conduct less in-depth investigations. Moreover, the Coast Guard does not investigate accidents involving large passenger vessels (i.e., cruise ships) operating from U.S. Ports and carrying primarily U.S. Passengers when the accidents occur in international waters.

Recreational Boating Accident Investigation by States

Recreational boating accidents are, for the most part, investigated by the States in whose jurisdiction they occur. State programs for boating accident investigations, and for recreational boating safety in general, vary widely. For example, in some States boating accidents are investigated by the Fish and Game Warden while other States have separate police units for marine matters.

State investigation of alcohol use in accidents also varies widely, although many States have made progress in adopting a uniform procedure for addressing this issue. Since 1971, the Coast Guard has been empowered to provide grants-in-aid to the States in an effort to promote uniformity and cooperation regarding boating safety and accident investigation.

The Coast Guard recently has focused its efforts on improving State reporting of accidents for inclusion in the national data base which is published yearly in "Boating Statistics". In particular, both the Coast Guard and the States have agreed that improvements are needed in the uniform reporting of alcohol-related boating accidents, and the National Association of State Boating Law Administrators is working with the Coast Guard to promote these improvements.

Safety Board Role in Marine Accident Investigations

Federal marine safety standards came into being before the Civil War, and commercial marine accidents have been investigated by the Federal government since 1871. Before 1966, the U.S. Coast Guard was exclusively responsible for these investigations. When the Safety Board was established in 1966, it was authorized to review Coast Guard investigations and determine the probable cause(s) of those accidents. In 1974, the Safety Board was authorized to investigate marine accidents involving public and nonpublic vessels and major marine accidents under joint regulations with the Coast Guard. In 1981, in order to preclude any appearance of a conflict of interest on the part of the Coast Guard, the Safety Board and the Coast Guard agreed that, in accidents involving significant safety issues relating to Coast Guard safety functions, the Safety Board will conduct an independent investigation and hearing, with full cooperation by the Coast Guard. The 1981 agreement also stated that the Board would conduct independent investigations of certain public and nonpublic vessel accidents.

Of the approximately 4,000 reportable accidents involving commercial vessels and of the more than 6,500 serious recreational boating accidents that occur each year, about 70 accidents fall within the investigative jurisdiction of the Safety Board, that is, they involve fatal public or nonpublic vessel collisions, or are major accidents (i.e., $500,000 in property damage; six or more lives lost; or the total loss of a self-propelled vessel of more than 100 gross tons). However, because of limited resources, the Board is able to independently investigate only about 7 (or 10 percent) of these accidents each year.

In addition, the Board investigates about three accidents per year jointly with the Coast Guard, and requests that the Coast Guard investigate the remainder for the Board. In the latter case, the Board determines the probable cause of the accident based on an analysis of the evidence prepared and submitted by the Coast Guard.

As in the other transportation modes, the Safety Board also conducts safety studies involving specific marine safety issues. These may be based on previous Safety Board accident investigations, or on analytical reviews of marine regulations, practices, procedures, and standards. Like accident investigations, and like safety studies in the other modes, marine safety studies result in the issuance of safety recommendations to Federal and/or State agencies, private industry, and industry associations.

The Board's limited resources have only permitted the investigation of very few special emphasis area accidents such as recreational boating accidents. For example, in the NTSB Safety Report "Progress of State Laws on Alcohol Use in Recreational Boating" adopted December 17, 1988, only 12 boating accidents were investigated. The 12 accidents resulted in 21 deaths and 27 injuries. About 1,000 lives are lost each year in recreational boating accidents.

PIPELINE

Accident Investigations by the Office of Pipeline Safety and by the States

More than 1.6 million miles of pipelines carry natural gas and hazardous liquids to more than 47 million customers in the U.S. The regulation and inspection of this vast network of gas pipelines and the investigation of accidents for enforcement purposes are shared in a complex pattern of responsibilities among the Office of Pipeline Safety (OPS) of the U.S. Department of Transportation (DOT) and a variety of State agencies. The enforcement of Federal pipeline safety regulations on interstate facilities, including the investigation of accidents, is the responsibility of the OPS. However, given the enormous size of the pipeline system, OPS inspectors located in five regional offices share this responsibility, through a variety of arrangements, with State agencies.

There are a number of limitations on the usefulness of the OPS and State accident investigations. For example, although the OPS requires that a written report be prepared for those accidents investigated by State agency personnel, the State is not required to file these reports with the DOT. Furthermore, despite the fact that the OPS provides general guidance on the types of information that should be included, there is no established format for the preparation of the report nor is there a set time interval after the accident within which the report must be completed.

For accidents investigated by OPS personnel, reports of the investigations are completed in a uniform format and are filed in the regional offices and headquarters, but they are not published. These OPS investigations also are seriously limited in their safety usefulness because they focus primarily on the question of whether Federal regulations were violated or need to be revised as a result of the accident.

Nevertheless, the Board has noted substantial improvements in these agencies' accident investigation capabilities in recent years, and the services rendered to the Safety Board by these inspectors often have been invaluable. These improvements are largely due to upgrading of the qualification standards used by the States for inspection personnel and to the higher quality and more widespread training that State personnel are now receiving from industry organizations and the DOT.

Because the bulk of pipeline accident data is, of necessity, recorded by State agencies, the Safety Board believes that the usefulness of State accident reports for improving the Safety of pipeline transportation could and should be enhanced by: (1) establishing clear reporting criteria for use by the States; (2) requiring that the State reports be filed with the DOT; and (3) including these State-produced data in the DOT accident data base. Currently, the only data on pipeline accidents that are required to be submitted to the DOT and that are stored on a computer are the industry-prepared leak reports. At present, the valuable resource of State accident reports is not being used to the best advantage to provide better guidance on emerging safety problems and how to combat them.

The Safety Board's Role in Pipeline Accident Investigations

The Safety Board is responsible for investigating all pipeline accidents in which there is a fatality or substantial property damage. In addition, the Board also investigates pipeline accidents involving selected accident prevention issues. Under its Memorandum of Understanding with the DOT's Office of Pipeline Safety (OPS), the Board can delegate to the OPS the investigation of accidents that occur when the Board is unable to respond due to insufficient resources.

In 1988, there were 454 pipeline accidents that were reported to the OPS under its criteria. These accidents generally involved a death or hospitalization, property damage of more than $50,000, or the release of the transported material into the environment. Nineteen accidents were investigated in depth by the Safety Board, each involving a fatality, substantial property damage, and/or significant safety issues. The remainder of these accidents were investigated to some degree by the States or the OPS.

HAZARDOUS MATERIALS

Accident Investigations by Administrations of the Department of Transportation (DOT) and by States

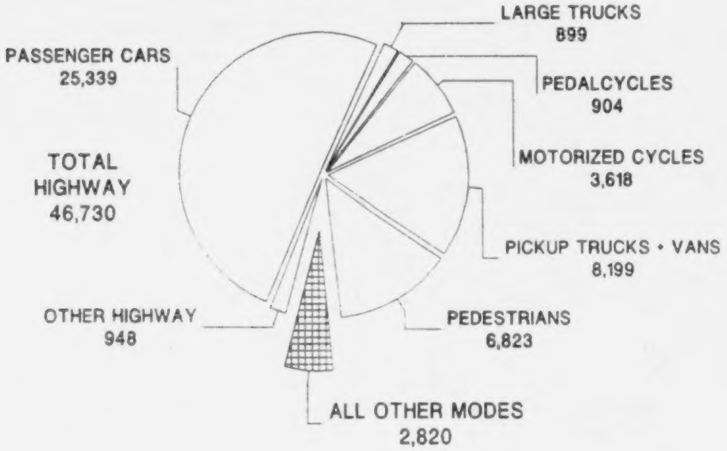
About 4 billion tons of regulated hazardous materials are shipped each year with more than 250,000 shipments of hazardous materials entering into this Nation's transportation system daily. Responsibility for the regulation, inspection, and enforcement of the transportation of these hazardous materials shipments is shared in a nonuniform manner among the DOT's modal administrations, the Research and Special Program Administration (RSPA), and the States. The modal administrations are generally responsible for shippers and transporters with some responsibilities being shared with the States. The RSPA is responsible for issuing the hazardous materials regulations, and for inspecting shippers and manufacturers of shipping containers that are of a multi-modal nature. The responsibility for investigating transportation accidents is similarly diversified.

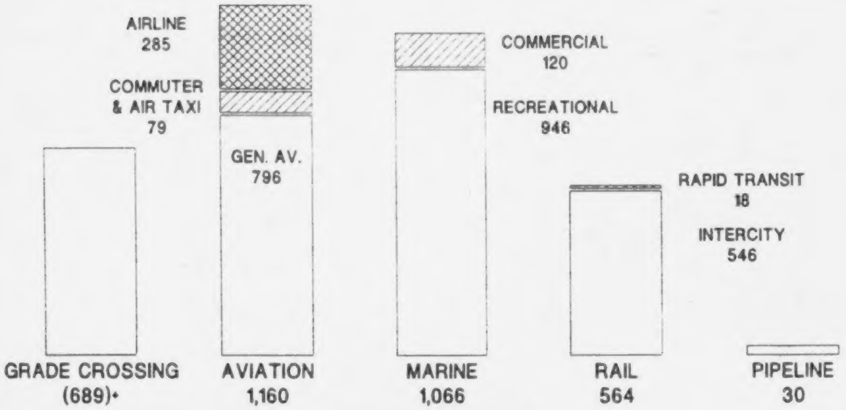
The Safety Board's Role in Hazardous Material Accident Investigations

The Safety Board is responsible for investigating accidents that involve threats to public safety during the transportation of hazardous materials, or that result in deaths, serious injuries, or major disruptions within communities caused by the release of hazardous materials. In addition, the Board also investigates accidents involving the transportation of hazardous materials that offer opportunities for promoting the implementation of previously identified safety improvements.

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

TRANSPORTATION FATALITIES•
49,550 IN 1988

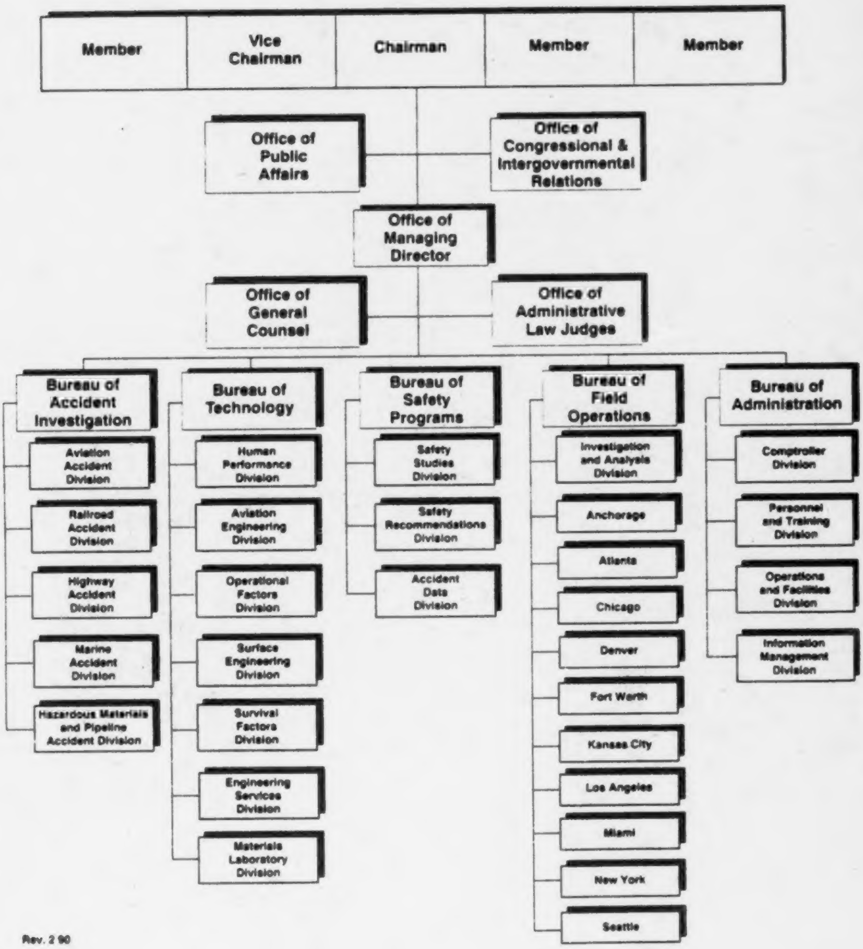




ALL OTHER MODES

- • PRELIMINARY ESTIMATES
- • THE GRADE CROSSING FATALITIES ARE COUNTED IN THE HIGHWAY AND RAIL CATEGORIES.

National Transportation Safety Board


Member
Vice Chairman
Chairman
Member
Member
Office of Public Affairs
Office of Congressional & Intergovernmental Relations
Office of Managing Director
Office of General Counsel
Office of Administrative Law Judges
Bureau of Accident Investigation
Aviation Accident Division
Railroad Accident Division
Highway Accident Division
Marine Accident Division
Hazardous Materials and Pipeline Accident Division
Bureau of Technology
Human Performance Division
Aviation Engineering Division
Operational Factors Division
Surface Engineering Division
Survival Factors Division
Engineering Services Division
Materials Laboratory Division
Bureau of Safety Programs
Safety Studies Division
Safety Recommendations Division
Accident Data Division
Bureau of Field Operations
Investigation and Analysis Division
Anchorage
Atlanta
Chicago
Denver
Fort Worth
Kansas City
Los Angeles
Miami
New York
Seattle
Bureau of Administration
Comptroller Division
Personnel and Training Division
Operations and Facilities Division
Information Management Division

Rev. 2 90

Panama Canal Commission

1991

JUSTIFICATION OF PROGRAMS AND ESTIMATES FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 1991

PANAMA CANAL COMMISSION
Justification of Programs and Estimates for the Fiscal Year Ending September 30, 1991

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PANAMA CANAL COMMISSION
Summary Statement
Introduction

1. The budget programs for fiscal year 1991 presented here represent the operating and capital requirements of the Panama Canal Commission for the operation and maintenance of the Panama Canal in accord with the Panama Canal Treaty of 1977 and it's implementing legislation, the Panama Canal Act of 1979.

2. The Panama Canal Commission is an agency of the United States Government operating by authority of the Congress of the United States with funds provided for those purposes authorized. The Commission has a nine-member supervisory board, an Administrator, and a Deputy Administrator, all of whom are appointed by the President of the United States. Five members of the board are United States citizens and four members, Panamanian citizens. Five board members, of whom at least three are U. S. nationals, constitute a quorum for the conduct of business. The Administrator is a U. S. citizen and the Deputy Administrator, a Panamanian national. Effective January 1, 1990, under the terms of the Treaty, the Administrator will be a Panamanian and the Deputy, a U. S. national; however, the U. S. majority on the board will continue to the year 2000.

Operating Expenses

3. Total operating costs including depreciation and interest in 1991 are estimated at $480.8 million. This amount includes payments to Panama totaling $84.5 million, comprising net tonnage payments of $64.5 million, a fixed annuity of $10.0 million, and payments for public services of $10.0 million. Section 1602 (b) of Public Law 96-70 prescribes that tolls shall not be set at rates calculated to cover payments to the Republic of Panama pursuant to paragraph 4(c) of Article XIII of the Panama Canal Treaty of 1977. Accordingly, there is no provision in the fiscal year 1991 budget to pay Panama any contingent profit

payment. Other major cost components in the total of $480.8 million are the reimbursement to the Civil Service Retirement Fund for special retirement benefits provided Commission employees ($15.1 million) and the interest on the net direct investment of the United States in the Canal ($13.1 million).

4. The Commission's total operating income in 1991 is estimated at $484.5 million, consisting of $366.7 million in tolls revenue and $117.8 million of other revenues derived from miscellaneous services provided transiting vessels, the Republic of Panama, other U.S. Government agencies operating in Panama, Commission employees, and others eligible for services under the terms of the Treaty. The tolls estimate for 1991 reflects $32.7 million of additional revenue to be derived from a 9.8 percent toll rate increase, effective October 1, 1989. In addition, the Commission also generates receipts for the capital program from the transit reservation system ($6.7 million) and the sale of fixed assets ($0.1 million).

Capital Outlay

5. Panama Canal Commission obligations for new capital projects and equipment acquisitions in 1991 are projected at $30.0 million. Included in the 1991 program is the procurement of one tugboat, replacement of miscellaneous floating equipment, and the continuing installation of fire proctection systems at the locks.

PANAMA CANAL COMMISSION
Revolving Fund
Program and Financing

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Program by Activities:			
Operating expenses:			
1. Transit operations	$ 281,755	$ 290,438	$ 304,058
2. Supporting services	57,829	61,160	69,243
3. Administrative expenses	45,698	47,258	48,941
4. Interest expense	13,878	13,500	13,100
5. Special retirement costs	15,144	15,144	15,144
6. Other general	17,908	16,501	16,952
Total operating expenses	432,212	444,001	467,438
Capital investment:			
1. Transit operation projects	25,135	19,813	19,236
2. General support projects	5,527	6,306	5,098
3. Utilities projects	4,849	3,881	5,666
4. Accomplishment of prior year slippage	...	7,442	...
Total capital investment	35,511	37,442	30,000
Total obligations	467,723	481,443	497,438
Financing:			
Offsetting collections from: Non-Federal sources	-439,700	-477,365	-491,274
Recovery of prior year obligations	-1,387	...	...
Unobligated balance available, start of year	-4,175	...	...
Budget authority	$ 22,461	$ 4,078	$ 6,164
Budget Authority:			
Permanent:			
Authority to borrow (Indefinite, P.L. 100-203)	$ 22,461	$ 4,078	$ 6,164
Relation of obligations to outlays:			
Obligations incurred, net	$ 28,023	$ 4,078	$ 6,164
Obligated balance, start of year:			
Authority to borrow	...	22,461	26,539
Fund balance	140,498	99,304	103,501
Obligated balance, end of year:			
Authority to borrow	-22,461	-26,539	-32,703
Fund balance	-99,304	-103,501	-95,688
Adjustments to unexpired accounts	- 1,387	...	...
Outlays	$ 45,369	$ -4,197	$ 7,813

Note: Authority to borrow is available to the Panama Canal Commission on a permanent indefinite basis. This authority is limited only in that the amount of borrowing outstanding at any time cannot exceed $100 million.

PANAMA CANAL COMMISSION
Revenue and Expense

(Dollars in thousands)

	1989 Actual	1990 Estimate	1991 Estimate
Revenues:			
Transit operations	$399,775	$431,933	$443,148
Supporting services	35,665	38,412	40,885
Other General expenses	360	420	441
Total operating revenues	435,800	470,765	484,474
Expenses:			
Transit operations	$290,305	$308,122	$318,903
Supporting services	62,719	66,947	70,978
Administrative expense under limitation	45,989	47,258	48,941
General expense not under limitation	44,475	42,238	41,952
Total operating expenses	443,488	464,565	480,774
Recovery of prior years' loss	...	6,200	3,700
Operating margin or cost (-)	$ -7,688	$ ...	$ ...

Detail of Offsetting Collections

(Dollars in thousands)

	1989 Actual	1990 Estimate	1991 Estimate
Operating Revenues from:			
Tolls	$329,766	$360,100	$366,700
Navigation services	64,637	66,566	71,223
Utilities services	33,826	36,642	39,122
Fire Protection services	4,227	4,226	4,174
Housing rentals	1,499	1,410	1,385
All other operating revenues	1,845	1,821	1,870
Total operating revenues	435,800	470,765	484,474
Other collections:			
Booking fees	4,452	6,500	6,700
Sale of fixed assets	111	100	100
All other	-663	...	...
Total other collections	3,900	6,600	6,800
Total offsetting collections	$439,700	$477,365	$491,274

PANAMA CANAL COMMISSION

REVOLVING FUND

Statement of Financial Condition

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
ASSETS:			
Fund balance with Treasury	$ 99,304	$103,501	$ 95,688
Postal and trust fund balance	2,538	2,538	2,538
Accounts receivable, net	11,372	11,372	11,372
Prepayments	246	...	...
Inventories, net	37,723	36,714	39,449
Properties, plant, and equipment, net	484,746	489,160	495,650
Other assets	240,457	211,950	186,041
Total assets	876,386	855,235	830,738
LIABILITIES:			
Accounts payable	41,259	37,275	37,731
Funded accrued liabilities (Payroll & benefits)	54,145	55,283	52,700
Actuarial liabilities	237,451	214,844	192,285
Other liabilities	59,840	63,483	67,001
Total liabilities	392,695	370,885	349,717
Reserves	10,399	11,058	7,729
Total liabilities and reserves	403,094	381,943	357,446
EQUITY:			
Revolving fund	473,292	473,292	473,292
Total Equity	$473,292	$473,292	$473,292

PANAMA CANAL COMMISSION
Summary of Operating Expenses by Activity

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Transit Operations:			
Maintenance of channels, dams and spillways	$ 36,900	$ 39,550	$ 42,038
Navigation service and control	79,795	81,678	85,701
Lock operations	49,006	52,270	50,161
General repair, engineering, and maintenance services	51,433	50,808	54,874
Fire and facility protection service	11,371	12,176	12,924
Public service payment to Panama	10,000	10,000	10,000
Annuity payment to Panama	10,000	10,000	10,000
Net tonnage payment to Panama	59,819	59,648	64,532
Other general canal expense	11,821	20,692	20,920
Subtotal	320,145	336,822	351,150
Intra-Commission transfers	-29,840	-28,700	-32,247
Net operating costs, Transit operations	290,305	308,122	318,903
Supporting Services:			
Supply and Logistical Services			
Logistical services	27,021	28,026	29,802
Motor transportation	10,772	10,560	10,662
Utilities			
Power system	19,187	24,302	25,922
Communications system	8,934	8,215	9,118
Water system	6,296	6,704	6,860
Central air conditioning	1,306	1,346	1,327
Other Supporting Services			
Housing	5,419	4,592	4,325
General support services	6,422	6,224	6,664
Subtotal	85,357	89,969	94,680
Intra-Commission transfers	-22,638	-23,022	-23,702
Net operating costs, Supporting Services	62,719	66,947	70,978
Administrative and General Expenses:			
Administrative Expense under limitation:			
Executive direction	10,517	10,663	11,160
Operations direction	2,014	2,141	2,240
Financial management	12,532	13,238	13,857
Personnel administration	3,775	4,346	4,543
Employment costs	17,151	16,870	17,141
Subtotal	45,989	47,258	48,941
General Expense not under limitation:			
Amortization of special retirement costs	15,144	15,144	15,144
Interest on U. S. investment	13,878	13,500	13,100
Other general expense	15,453	13,594	13,708
Subtotal	44,475	42,238	41,952
Net operating costs, Administrative & General	90,464	89,496	90,893
Total Operating Expenses	$443,488	$464,565	$480,774

PANAMA CANAL COMMISSION
Canal Traffic and Tolls

	1989 Actual	1990 Estimate	1991 Estimate
		(Dollars in thousands)	
Tolls Income:			
Commercial traffic:			
Ocean-going	$327,851	$358,437	$365,037
Small craft	96	110	110
Total commercial tolls	327,947	358,547	365,147
U.S. Government traffic:			
Ocean-going	1,807	1,537	1,537
Small craft	12	16	16
Total U. S. Government tolls	1,819	1,553	1,553
Total tolls	$329,766	$360,100	$366,700
Number of Transits:			
Commercial traffic:			
Ocean-going	11,989	11,985	12,100
Small craft	997	950	950
Total commercial	12,986	12,935	13,050
United States Government traffic:			
Ocean-going	74	80	80
Small craft	287	300	300
Total U. S. Government	361	380	380
Total revenue transits	13,347	13,315	13,430
Free transits, not included above:			
Ocean-going	12	10	10
Small craft	30	50	50
Total free transits	42	60	60
Total number of transits	13,389	13,375	13,490
Other Data:			
Average number of ocean-going vessels per day	33.1	33.1	33.4
Total Panama Canal net tons transiting (in thousands)	186,935	186,400	189,800

PANAMA CANAL COMMISSION
Traffic and Tolls Statistics

Fiscal Years Actual 1971 thru 1989 - Estimated 1990 and 1991

	Number of Transits				
Fiscal Year	Commercial Revenue Transits	U.S. Government Vessels	Total Revenue Transits	Total Tolls (Dollars in thousands)	PCC Net Tonnage (In Millions)
1971	14,601	626	15,227	$100,567	115.0
1972	14,453	561	15,014	101,488	116.3
1973	14,563	491	15,054	113,381	129.1
1974	14,859	358	15,217	121,320	138.1
1975	14,413	280	14,693	143,332	136.6
1976	12,902	221	13,123	134,988	128.6
19TQ	3,241	54	3,295	35,465	33.9
1977	12,655	365	13,020	164,685	134.2
1978	13,469	290	13,759	195,735	157.7
1979	13,871	426	14,297	209,520	168.5
1980	14,295	377	14,672	293,444	183.2
1981	14,675	314	14,989	303,080	189.5
1982	14,839	351	15,190	325,589	204.0
1983	12,517	367	12,884	287,791	170.6
1984	12,032	378	12,410	289,155	163.8
1985	12,308	402	12,710	300,808	170.3
1986	12,837	401	13,283	322,734	183.8
1987	13,082	314	13,396	329,859	187.3
1988	13,078	315	13,393	339,319	192.4
1989	12,986	361	13,347	329,766	186.9
1990 (Est.)	12,935	380	13,315	360,100	186.4
1991 (Est.)	13,050	380	13,430	$366,700	189.8
FY 1989 Actual by month					
October, 1988	1,025	26	1,051	$ 28,209	16.0
November	1,048	24	1,072	28,096	16.0
December	1,109	11	1,120	29,386	16.7
January, 1989	1,094	20	1,114	28,159	16.0
February	1,039	45	1,084	25,944	14.7
March	1,193	32	1,225	27,937	15.8
April	1,214	19	1,233	28,497	16.1
May	1,186	46	1,232	28,440	16.2
June	995	42	1,037	25,300	14.3
July	1,103	25	1,128	26,653	15.0
August	1,023	42	1,065	27,507	15.6
September ...	957	29	986	25,638	14.5
Total FY1989	12,986	361	13,347	$329,766	186.9
FY 1990 Actual YTD					
October, 1989	1,061	29	1,090	$ 31,968	16.4
November	1,025	44	1,069	29,406	15.2
December	905	18	923	26,067	13.5
FY90 to date	2,991	91	3,082	$ 87,441	45.1

TRANSIT OPERATIONS
Maintenance of Channels, Dams and Spillways

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Revenue:	$ 140	$ 106	$ 111
Operating Expenses:			
Dredging operations	$ 7,201	$ 7,486	$ 7,750
Other support equipment operations	5,623	5,857	6,042
Drilling and blasting operations	1,261	1,413	1,536
Meteorological and hydrographic surveys	2,650	2,711	2,903
Maintenance, repairs and overhaul	5,104	5,803	7,251
Supervision and general	2,396	2,618	2,654
Other channel maintenance	1,887	3,190	3,412
Depreciation and other nonfund	10,778	10,472	10,490
Total operating expenses	36,900	39,550	42,038
Intra-commission transfers	-396	-10	-10
Net operating expenses	36,504	39,540	42,028
Unfunded adjustments to net operating expenses	-10,466	-10,097	-9,941
Change in selected resources	-691	138	795
Total operating obligations	$ 25,347	$ 29,581	$ 32,882

The basic purpose of this function is to maintain proper navigation depth in the channel. It also includes: (1) observation and study of meteorological, hydrographic, and seismologic conditions and (2) operation and maintenance of a wide range of equipment and facilities such as channel lights, beacons, buoys and other navigation aids, the dams and spillways, and other earth works and structures adjacent to the waterway.

Revenue is derived from sales of services to outside agencies or private organizations on an unscheduled basis such as "heavy lift" services of the floating cranes GOLIATH and HERCULES or the craneboat ATLAS.

Operating expenses include:

Dredging operations - Dredge operating costs including running maintenance performed by the crew, supplies and materials, and supporting equipment including pipe lines, and launch and tug support.

Other support equipment operations - Operating costs of the dredging tug and launch fleet, craneboat ATLAS, and the floating cranes HERCULES and GOLIATH.

Drilling and blasting operations - Operating cost of the drillboat THOR, including explosives, and operating costs of land coredrill equipment used in Canal deepening and widening projects, bank stabilization program, and instrumentation of dams and spillways.

Meteorological and hydrographic surveys - Operating costs of the Meteorological and Hydrographic Branch, which manages the water resources and performs hydrographic surveys to determine dredging requirements. Functions include operation of rainfall measurement stations, meteorological forecasts, flood control, and topographic surveys.

TRANSIT OPERATIONS
Maintenance of Channels, Dams and Spillways (Cont'd)

Maintenance, repairs, and overhaul services - Cost of the major maintenance and overhaul of dredging floating equipment which is usually accomplished by the Industrial Division on a cost transfer basis. Also includes the cost of maintenance and repair of the Canal's navigational aids and Dredging Division facilities.

Supervision and general - Costs not assigned to specific functions, e.g., supervision, administration, logistics.

Other channel maintenance - Costs of remedial work on slide areas, bank erosion, maintenance of the Atlantic breakwater, maintenance of dams and spillways, oil pollution and debris control, and other projects to ensure the safety and stability of the Canal.

Navigation Service and Control

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Revenues:			
Harbor pilotage	$ 2,126	$ 2,139	$ 2,532
Handling ships' lines	26,679	26,535	28,385
Tug and launch services	35,593	37,650	40,059
Wharfage, moorings, right of basin, etc.	239	242	247
Total revenue	$64,637	$66,566	$71,223
Operating Expenses:			
Transit and port pilotage	$24,186	$24,455	$25,231
Vessel control, admeasurement and dispatch	4,734	4,905	5,095
Handling ships' lines	15,384	15,722	17,043
Tug and launch operations	21,840	22,370	23,296
Maritime Training Program	4,142	3,938	4,338
Supervision and general	2,463	2,681	2,938
Depreciation	2,212	2,687	2,779
Accrual for floating equipment overhaul	4,834	4,920	4,981
Total operating expenses	79,795	81,678	85,701
Unfunded adjustments to net operating expenses	-2,468	-4,024	-1,526
Change in selected resources	-201	470	31
Total operating obligations	$77,126	$78,124	$84,206

The Navigation Service and Control function is responsible for vessel transits through the Canal, vessel docking, and related services such as tug and launch service, boarding and admeasuring services, traffic control, and linehandling services.

TRANSIT OPERATIONS
Navigation Service and Control(Cont'd)

Revenues are derived from:

Harbor pilotage - Providing pilotage services for vessel movements in and around harbors and piers.

Handling ships' lines - Providing deckhand services for handling ships' lines at the locks, handling tug lines, and assisting in handling lines for docking ships after transit.

Tug and launch services - Providing tug and launch services associated with assisting vessels in transiting the Canal.

Wharfage, moorings, right of basin, and miscellaneous - Providing services for vessel moorings in Canal waters and berthing at Commission retained docks and piers.

Operating expenses include:

Transit and port pilotage - Cost of pilotage of transiting vessels, pilotage for vessel movements in and around harbors and piers, administrative and special duty assignments given to pilots, and advisory pilotage furnished by Dredging Division for pilotage of small vessels through the Canal. Also included are other miscellaneous expenses related to pilotage.

Vessel control, admeasurement, and dispatch - Costs associated with the operation of the Marine Traffic Control Center and signal stations; admeasurement and boarding services; and the operation of the Ship Data Bank Control Center.

Handling ships' lines - Cost of providing deckhand services including related supervision and clerical personnel; contract bus service to remote work sites; and other general expenses associated with handling ships' lines.

Tug and launch operations -
Tug operations - Cost of Port Engineer and towboat shore stations; tug crews (master, engineers, oilers, seamen leaders, and seamen); cost of operating supplies and materials (fuel, oil, lines and other consumables); and other services directly related to the operation of the tug fleet.

Launch operations - Cost of personnel services for launch crews and launch dispatchers; cost of supplies and materials (fuel and other consumables); and other general expenses associated with launch services.

Maritime training program - Cost associated with Maritime training including related supervision and clerical personnel; personnel services of pilots-in-training and towboat trainees (apprentice mate trainees, mates, assistant engineers and engineer trainees); operating supplies and materials (VHS tapes, textbooks, software programs, and audio-visual aids); and other general expenses directly related to Maritime training.

Supervision and General - Cost of supervision, administration and general support operations and other general costs associated with the navigation and control function.

Accrual for floating equipment overhaul - Provides for overhaul and maintenance requirements on the Commission's tugboat fleet. The cost of performing such work is allocated to operations through an annual provision based on planned overhaul, major maintenance and emergency work.

TRANSIT OPERATIONS
Lock Operations

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Revenue:	$ 1	$ ...	$ ...
Operating Expenses:			
Lockage operations	$12,674	$13,380	$13,905
Locks maintenance and repair	25,027	22,596	24,040
Supervision and general	2,154	1,997	2,213
Accrual for locks overhaul, nonfund	6,353	11,402	7,069
Depreciation	2,798	2,895	2,934
Total operating expenses	49,006	52,270	50,161
Intra-Commission transfers	-19	...	...
Net Operating Expenses	48,987	52,270	50,161
Unfunded adjustments to net operating expense	-2,958	-3,522	-2,405
Change in selected resources	293	432	169
Total operating obligations	$46,322	$49,180	$47,925

This activity is responsible for the direct supervision, operation, and maintenance of the locks and appurtenances, including periodic major overhauls of the underwater portions of the locks.

Operating expenses include:

Lockage operations - Cost of locks personnel handling vessels at the locks including towing-locomotive operators, lockmasters, control house personnel, and boatmen.

Locks maintenance and repair - Cost of repairs and/or maintenance of machinery, equipment and structures at the three sets of locks.

Supervision and general - Management and general operations personnel services cost; supplies and materials; and other general expenses.

Accrual for lock overhauls, nonfund - The method used for accruing the cost of overhauling the locks is a moving average recognizing differences in the actual and estimated costs as they become known.

Schedule of Overhaul Expenditures

Year	Description of Work	Expenditures (Dollars in thousands)
1989 Actual	Overhaul Pedro Miguel locks miter gates 68 and 69, caissons and other overhaul equipment.	$ 3,883
	Rehabilitate Gatun miter gates 29 and 30 and prepartion for FY 1990 overhaul - miter gates 5, 6, 13 and 14.	1,757
	Installation of "B" valves, Miraflores.	553
1990	Overhaul Gatun Locks miter gates 5, 6, 13, and 14 and caissons and other overhaul equipment; conversion of rising stem valves and repairs to rising stem valves and cylindrical valves.	8,677

TRANSIT OPERATIONS
Lock Operations (Cont'd)
Schedule of Overhaul Expenditures (Cont'd)

Year	Description of Work	Expenditures (Dollars in thousands)
1990 Cont'd	Purchase 12 cylindrical valves for installation at Miraflores locks in FY 1991, preparatory work and rehabilitation of rising stem valves; and rehabilitate and paint spare miter gates	1,801
	Purchase "B" valves, Pedro Miguel	297
1991	Overhaul Gatun miter gates 7, 8, 15 and 16, caissons and cther overhaul equipment.	6,829
	Rehabilitate 12 rising stem valves and preparation for FY 1992 overhaul, Miraflores.	633
	Installation of "B" valves, Pedro Miguel	$ 136

General Repair, Engineering and Maintenance Services

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Revenue:	$ 1,004	$ 935	$ 940
Operating Expenses:			
General maintenance	$ 15,606	$ 14,737	$ 15,592
Vessel repair services	17,698	17,363	19,579
Electrical services	6,770	7,190	7,774
Grounds and sanitation services	5,187	5,437	5,549
Engineering services	3,033	3,061	3,227
Contract and inspection services	1,814	1,865	1,944
Depreciation and other nonfund	1,325	1,155	1,209
Total operating expenses	51,433	50,808	54,874
Intra-commission transfers	-29,425	-28,690	-32,237
Net operating expenses	22,008	22,118	22,637
Unfunded adjustments to net operating expenses	-1,325	-1,155	-1,209
Changes in selected resources	- 503	893	- 94
Total operating obligations	$ 20,180	$ 21,856	$ 21,334

This activity provides the wide range of maintenance and repair work on structures, floating equipment, and shop and construction equipment necessary for the safe and efficient operation of the total Canal enterprise. Included are related engineering services such as surveys, preparation of designs, cost estimates and specifications for work, and the general supervision and administration of construction work performed for the Commission by private contracting firms.

Revenues are received from services provided other government agencies, such as the maintenance of Navy facilities at Galeta Island and repair of miscellaneous facilities and equipment as requested. Revenues are also received from refuse disposal and grounds care services provided by contractual arrangement for Department of Defense activities and facilities.

TRANSIT OPERATIONS
General Repair, Engineering and Maintenance Services (Cont'd)

Operating expenses include:

General maintenance - Cost of maintenance and improvements to Commission buildings, employee housing, and certain sewer systems; locks rehabilitation work and overhaul support (exclusive of work performed by contract). Includes cost of operating an environmental and testing laboratory in the Water and Laboratories Branch at Miraflores. Functions of the laboratory include tests on construction materials; miscellaneous chemicals and physical analyses; testing of such items as paint, oil, corrosion products, and soils, monitoring salt and fresh water quality; air quality testing; and analysis of oil and industrial hygiene samples.

Vessel repair services - Cost of operating a repair facility for Commission floating equipment including design, overhaul, and repair; maintenance of salvage and diving capability; performance of marine damage surveys; and inspection and certification of cranes and elevators.

Electrical services - Cost of providing electrical maintenance and repair for Commission buildings and employee housing, and maintenance support for other Commission units as required.

Grounds and sanitation services - Cost of environmental sanitation and grounds care activities in Commission housing and Canal operating areas. Includes cost of operating and maintaining sanitary landfill disposal sites, one each on the Atlantic and Pacific side of the Isthmus.

Engineering services - Cost of all engineering and architectural designs, estimates, specifications, and all pre-contract functions; engineering studies; and annual inspection program for buildings and structures.

Contract and inspection services - Cost of contract construction management including contract formation and award; quality and safety assurance; construction problem resolution; contract modifications, and payment approval.

TRANSIT OPERATIONS
Fire and Facility Protection Services

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Revenue:	$ 4,227	$ 4,226	$ 4,174
Operating Expenses:			
Fire protection	$ 5,108	$ 5,409	$ 5,621
Facility protection	6,196	6,687	7,227
Depreciation	67	80	76
Total operating expenses	11,371	12,176	12,924
Unfunded adjustments to total operating expenses	-67	-80	-76
Changes in selected resources	-35	-85	-25
Total operating obligations	$11,269	$12,011	$12,823

This activity provides for fire and facility protection services in Canal operating and other areas as specified under the Treaty and in accord with joint agreements between the Republic of Panama and the Commission.

Revenue is derived from fire protection services provided to Department of Defense sites within the Canal area.

Operating expenses include:

Fire Protection - Cost of firefighting and fire protection services throughout Canal Commission areas, defense sites, military areas of coordination, and ships in Canal waters. In most of these areas, firefighting is done in cooperation with the Cuerpo de Bomberos de Panama (Fire Department of Panama).

Facility protection - Cost of protection and security of selected Commission installations which are vital to the operation, management, and maintenance of the Panama Canal.

TRANSIT OPERATIONS
General Canal Expense

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Operating Expenses:			
Treaty derived costs:			
Payment to Panama for public services	$ 10,000	$ 10,000	$ 10,000
Fixed annuity payment to Panama	10,000	10,000	10,000
Panama Canal net-tons transiting payment to Panama	59,819	59,648	64,532
Cost for transfer of housing units to Panama	23	90	45
Health services provided by DOD	3,142	3,647	3,740
Maintenance of public areas	350	364	494
Apprentice and other trainees' salaries	2,605	2,980	3,033
Occupational health and safety	2,551	2,698	2,820
Technical resources center	516	529	547
Provision for catastrophic insurance	2,694	3,100	3,200
Board of Local Inspectors	323	350	361
Special canal studies	89	154	162
Miraflores swingbridge maintenance	33	91	94
Other	4,010	854	602
Depreciation	987	1,485	1,472
Accrual for marine accidents and other casualty losses	-5,643	4,200	4,200
Amortization of standby stock	141	150	150
Total operating expenses	91,640	100,340	105,452
Unfunded adjustments to total operating expenses	9,503	-705	-624
Change in selected resources	368	51	60
Total operating obligations	$101,511	$ 99,686	$104,888

This category of expense comprises the annuity and public service payments to Panama; the cost of health services provided to certain elderly and disabled former employees and their dependents; a provision for damages to vessels and other casualty losses; and other miscellaneous Canal expenses.

Operating expenses include:

Treaty derived costs - Costs include payments to Panama pursuant to Articles III and XIII of the Panama Canal Treaty of 1977 and the costs associated with the treaty-related transfer of housing units to Panama.

Health services provided by DOD - These health costs are for eligible individuals, their widows and dependents in the following categories: (1) Disability relief annuitants; (2) Civil Service annuitants (U. S. citizens retired before July 1, 1960 and non-U. S. citizens retired before November 1, 1970); (3) U.S. citizen non-profit organization employees who are not required to enroll in the Panama Social Security system; and (4) former Canal Zone Government agricultural land licensees (former Canal construction workers).

Maintenance of public areas - Cost of maintaining public areas including sewers, street lighting, miscellaneous streets and parking lots in Commission operating areas.

Apprentices' and other trainees' salaries - Salaries of 1st and 2nd year apprentices training for craft positions. Also includes salaries of pilot trainees under the Pilot Understudy Program and trainees under the Cooperative Education Program.

TRANSIT OPERATIONS
General Canal Expense (Cont'd)

Operating expenses include: (Cont'd)

Occupational health and safety - Costs of prevention of occupational diseases and injuries through surveys of industrial operations, as well as, monitoring the health aspects of the Commission's adherence to the Occupational Safety and Health Act of 1970, Public Law 91-596.

Technical resources center - Operating costs for a technical library which provides professional reference service to the Commission.

Provision for catastrophic insurance - Cost of procuring insurance coverage to protect against major and unpredictable revenue losses and expenses arising from catastrophic accidents.

Board of local inspectors - Cost of Board operation which includes principally investigations of marine accidents (including accidents in and outside the locks and in the terminal port areas involving Commission personnel and equipment).

Special canal studies - Costs of investigative methods to improve operation or maintenance of the Canal.

Miraflores swingbridge maintenance - Cost of maintaining the Miraflores swingbridge.

Accrual for marine accidents and other casualty losses - Cost of annual accrual for Commission's "self-insurance" for marine accident costs and other casualty losses.

SUPPORTING SERVICES
Supply and Logistical Services
Logistical Services

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Revenue:	$ 218	$ [illegible]16	$ 227
Operating Expenses:			
Cost of goods	$ 16,719	$ 17,798	$ 18,622
Procurement operations	1,472	1,545	1,624
Warehouse operations	3,900	4,214	4,398
Excess disposal	238	379	598
Supervision and general	4,085	3,677	4,137
Depreciation and other nonfund	607	413	423
Total operating expenses	27,021	28,026	29,802
Intra-commission transfer	-16,897	-17,614	-18,402
Net operating expenses	10,124	10,412	11,400
Unfunded adjustments to net operating expenses	-137	-113	-123
Change in selected resources	1,707	2,155	2,430
Total operating obligations	$ 11,694	$ 12,454	$ 13,707

SUPPORTING SERVICES
Supply and Logistical Services
Logistical Services (Cont'd)

This activity is comprised of the storehouse operations and provides for the purchasing, warehousing and issuing of supplies and materials required by Commission units. This includes operation of a procurement office in New Orleans and a furniture and equipment pool; collecting and processing scrap for sale; and public sale of surplus and obsolete equipment and materials.

Revenue is derived from the sale of supplies and material to the Armed Forces, other U. S. Government agencies, and authorized purchasers. Revenue is also generated from scrap and salvage sales.

Operating expenses includes the cost of such activities as:

Procurement and warehouse operations - Provides for procuring and maintaining an inventory of supplies and materials required for day-to-day operations.

Excess disposal - Provides for the public sale of surplus and obsolete equipment and material.

Motor Transportation

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Revenue:	$ -6	$ 12	$ 12
Operating Expenses:			
Motor vehicle operations	$ 2,617	$ 2,798	$ 2,877
Repair shops	3,527	3,647	3,819
Supervision and general	2,712	2,597	2,636
Depreciation	1,916	1,518	1,330
Total operating expenses	10,772	10,560	10,662
Intra-commission transfers	-37	-26	-27
Net operating expenses	10,735	10,534	10,635
Unfunded adjustments to net operating expenses	-1,916	-1,518	-1,330
Change in selected resources	19	3	3
Total operating obligations	$ 8,838	$ 9,019	$ 9,308

SUPPORTING SERVICES
Supply and Logistical Services
Motor Transportation (Cont'd)

This activity operates and maintains a consolidated motor vehicle pool system and facilities in support of Commission operations. Types of vehicles provided, serviced, and repaired include construction, material handling, firefighting, grounds maintenance, heavy equipment, and other miscellaneous vehicles. This activity also provides miscellaneous repair services to other units of the Commission.

Revenue is derived from charges for weighing of vehicles.

Operating expenses include:

Motor vehicle operations - Cost of operating the Motor Transportation Division official vehicles.

Repair shops - Cost of operating shops which provide for the repair and servicing of Commission motorized equipment and stationary machinery, and the operation of a tire recapping plant for official vehicles.

Supervision and general - Cost of management and general operations personnel services, supplies and materials and maintenance of facilities by other Commission units.

Utilities
Power System

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Revenue:	$21,684	$23,673	$25,971
Operating Expenses:			
Power generation	$13,089	$18,222	$20,007
Power transmission and distribution	3,464	3,677	3,577
Supervision and general	1,319	1,168	1,096
Depreciation	1,315	1,235	1,242
Total operating expenses	19,187	24,302	25,922
Intra-commission transfers	-5,544	-5,162	-4,953
Net operating expenses	13,643	19,140	20,969
Unfunded adjustments to net operating expenses	-1,315	-1,235	-1,242
Change in selected resources	1,676	-3,164	-220
Total operating obligations	$14,004	$14,741	$19,507

The power system operates and maintains generating stations, transmission lines, substations, and distribution systems to furnish electric power throughout the Canal area. Power is also purchased to augment the system's generating capacity. During periods when there is an adequate supply of water in Gatun and Madden Lakes, maximum possible power is supplied from Commission hydroelectric and steam sources. Additional load variations up to peak demands are supplied from gas turbines and purchased power, which also substitutes for base load units requiring emergency or planned maintenance. During the dry season, hydroelectric generation is curtailed to conserve water for transits and the energy is supplied from the most economical available source.

SUPPORTING SERVICES
Utilities
Power System (Cont'd)

Operating expenses include:

Power Generation - Cost of power generated by both hydroelectric and thermal means by Commission-owned and operated generating plants. Maintenance of generating equipment is included in this function.

Power transmission and distribution - Costs of power distribution and maintenance of the power distribution system, including transmission lines, transformers, and switching gear for the canal operating areas. (The U. S. military forces and Government of Panama are responsible for maintaining transmission lines within their respective areas).

Supervision and general - Costs associated with the administration of the power system including engineering, administrative and clerical support personnel, and maintenance of buildings and structures under the responsibility of the Power Branch.

Communications System

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Revenue:	$ 665	$ 669	$ 648
Operating Expenses:			
Maintenance and operation of telephone systems	$ 2,337	$ 2,979	$ 3,426
Maintenance and operation of electronic systems	2,453	2,618	3,085
Supervision and general	1,315	1,576	1,700
Depreciation	2,829	1,042	907
Total operating expenses	8,934	8,215	9,118
Intra-commission transfers	-160	-220	-320
Net operating expenses	8,774	7,995	8,798
Unfunded adjustments to net operating expenses	-2,829	-1,042	-907
Changes in selected resources	-62	110	220
Total operating obligations	$ 5,883	$ 7,063	$ 8,111

The Communications Branch provides full scope telecommunications and electronics services for the Commission; procurement, installation, and maintenance of facilities and equipment; and, where appropriate, operation of systems, such as telephone, microwave, radio paging, data transmission, and other communications systems throughout the Canal areas to support Canal operations.

Operating expenses include:

Maintenance and operation of telephone systems - Cost of basic telephone service and standard maintenance of central office equipment, outside plant and microwave and related systems. Also includes the cost for providing maintenance services on specialized telephone systems owned and operated by other Commission units.

SUPPORTING SERVICES
Utilities
Communications System (Cont'd)

Maintenance and operation of electronic systems - Cost of maintaining radio systems, digital systems and electronic equipment in general. Also includes the cost for providing maintenance service on specialized electronic systems owned and operated by other Commission units.

Supervision and general - Costs associated with the administration of the communication systems.

Water System

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Revenue:	$ 9,991	$10,943	$11,159
Operating Expenses:			
Pumping operations	$ 2,428	$ 2,225	$ 2,186
Filtration operations	1,677	1,683	1,893
Reservoir and water line maintenance	585	1,329	1,299
Miscellaneous operations and maintenance	539	651	662
Supervision and general	704	490	514
Depreciation	363	326	306
Total operating expenses	6,296	6,704	6,860
Unfunded adjustments to net operating expenses	-363	-326	-306
Change in selected resources	-491	27	28
Total operating obligations	$ 5,442	$ 6,405	$ 6,582

The water system consists of two principal units, one serving the Pacific side of the Isthmus, including certain areas of Panama City, and the other serving the Atlantic side, including the city of Colon. Raw water is pumped to filtration plants where it is filtered, treated, and then distributed to Canal and military operating areas and Panama.

Revenue is derived principally from sale of treated water to the Republic of Panama.

Operating expenses include the following:

Pumping operations - Cost of operating and maintaining water pumping equipment located at various pump stations throughout the Canal operating area, i.e., Balboa, Gamboa, Los Rios, Miraflores and Paraiso.

Filtration operations - Cost of operating and maintaining the two water filtration plants located at Miraflores and Mt. Hope.

Reservoir and water line maintenance - Cost of maintaining water reservoirs and distribution lines.

Miscellaneous operations and maintenance - Cost of maintaining water system equipment and water meters.

Supervision and general - Cost of administering the water system including sanitary engineering, administrative, and clerical support personnel.

SUPPORTING SERVICES
Utilities
Central Air Conditioning Service

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Revenue:	$1,486	$1,357	$1,344
Operating Expenses:			
Operation and maintenance	$1,209	$1,299	$1,281
Depreciation	97	47	46
Total operating expenses	1,306	1,346	1,327
Unfunded adjustments to total operating expenses	-97	-47	-46
Change in selected resources	-9	...	...
Total operating obligations	$1,200	$1,299	$1,281

This operation consists of a chilled water pumping and cooling plant in the Balboa area which chills and distributes water to users by means of insulated pipes. Two loops of insulated pipes are used, one carrying chilled water to the buildings in the Ancon area and the second serving the Balboa area. The buildings served provide the necessary air distribution systems, heat exchange equipment, and humidity controls. The Commission provides air conditioning service, on a reimbursable basis, for connected buildings transferred to the Government of Panama and other U. S. Government agencies.

Other Supporting Services
Housing

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Revenue:	$1,499	$1,410	$1,385
Operating Expenses:			
Housing operation	$ 286	$ 345	$ 321
Housing maintenance	4,487	3,646	3,397
Supervision and general	635	593	599
Depreciation and other nonfund	11	8	8
Total operating expenses	5,419	4,592	4,325
Unfunded adjustments to total operating expenses	-11	-8	-8
Changes in selected resources	-611	-200	200
Total operating obligations	$4,797	$4,384	$4,517

SUPPORTING SERVICES
Other Supporting Services
Housing (Cont'd)

The expenses shown represent the operation and maintenance costs associated with providing living quarters in the Canal operating areas for employees of the Panama Canal Commission and to certain other individuals eligible for quarters. These costs pertain to housing units that are under full control of the Commission. Revenue is derived from the rent charged to certain Commission employees who are not eligible for the equity adjustment and other individuals who are eligible for these quarters.

Operating expenses include:

Housing operation - Cost of miscellaneous services and the purchase of electric ranges and fire extinguishers.

Housing maintenance - Cost of routine and emergency repairs to quarters structures and related facilities (wiring, plumbing, sewage lines, electric panels, water heaters, lighting receptacles, plumbing and lighting fixtures), including interior and exterior painting of quarters.

Supervision and general - Costs associated with the administration and management of housing policies and regulations, assignment of quarters, settling occupant living condition complaints, and quarters operation and maintenance supervision.

General Support Services

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Revenue:			
Commission buildings	$ 104	$ 114	$ 120
Printing office	24	18	19
Total revenue	$ 128	$ 132	$ 139
Operating Expenses:			
Commission buildings	$3,985	$3,867	$4,188
Printing office	927	1,011	1,049
Employee fitness program	1,002	924	992
Depreciation and other nonfund	508	422	435
Total operating expenses	6,422	6,224	6,664
Unfunded adjustments to total operating expenses	-508	-422	-435
Change in selected resources	57	-7	1
Total operating obligations	$5,971	$5,795	$6,230

This activity provides for the costs of the repair and maintenance of Commission buildings; custodial services for Commission buildings and offices; operation of a printing office; and employee fitness program and activities for Commission employees and their dependents.

Revenue includes payments received from concessionaires for space rented in Commission buildings and certain printing services provided to other Government agencies.

SUPPORTING SERVICES
Other Supporting Services
General Support Services (Cont'd)

Operating expenses include:

Commission buildings - Cost of repairs, alterations, and maintenance of Commission office, warehouse, and other buildings. Also provides custodial services to Commission buildings not specifically assigned to other Commission units.

Printing office - Costs of operating a printing plant which provides press, duplicating, and related services. This activity is a Government field printing plant authorized under regulations of the Joint Committee on Printing.

Employee fitness program - Cost includes the operation of swimming pools; maintenance of tennis courts; conduct of off-duty morale support activities and physical fitness programs for the benefit of all Commission employees and their dependents; and furnishing a modest level of sporting equipment for certain community activities in Commission areas.

ADMINISTRATIVE AND GENERAL EXPENSES
Administrative Expense (Under Limitation)
Executive Direction

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Operating expenses:			
Supervisory Board	$ 80	$ 100	$ 103
Office of the Administrator and staff	4,488	4,705	4,919
Official residence	63	68	62
Office of the Commission Secretary	523	667	692
Administrative services	3,127	3,235	3,372
Office of Public Affairs	1,598	1,536	1,578
Guide services	201	212	261
Consultants and advisors	437	140	173
Total operating expenses	10,517	10,663	11,160
Change in selected resources	-60	...	...
Total operating obligations	$10,457	$10,663	$11,160

Executive direction provides for the management, planning, direction and control of overall Commission activities and operations. Provides for Congressional liaison through the Secretary's Office in Washington, D. C. and implements policies and directives of the Commission's Board.

This function includes the following:

Supervisory Board - Establishes policies for the Panama Canal Commission. Costs include a modest amount for official reception and representation of the Board.

ADMINISTRATIVE AND GENERAL EXPENSES
Administrative Expense (Under Limitation)
Executive Direction (Cont'd)

Office of the Administrator and staff - Exercises general and active control over the Commission's offices, business and operations, and general supervision over its agents, attorneys and employees. Included in the cost are the Administrator's official reception and representation expense, and a modest contingency for cash grants to assist community and recreational organizations in Commission areas.

Official residence - Provides for essential costs necessary to maintain the historical residence of the head of the agency. The official residence serves the dual purpose of providing facilities for official functions and also living quarters for the Administrator of the Panama Canal Commission. Included are costs of maintenance and utilities, but not wages and other personnel benefits for staff and guards.

Office of the Commission Secretary - Located in Washington, D. C., it has primary responsibility for liaison with the U.S. Congress and other Federal Government departments and agencies. Costs include the Secretary's official reception and representation expense.

Administrative services - Cost of general administrative services of the Commission such as records management, forms control, messenger and mail services, microfilming, translation and interpreter services, issuance of identification documents for employees and dependents, and issuance of travel and transportation orders.

Office of Public Affairs - Includes cost for public affairs and information activities, press and news releases, the publication of a biweekly newspaper in English and Spanish, and communication with Canal "customers", the maritime industry. Also includes cost of the graphics and audio-visual service.

Guide service - Costs are for orientation of official visitors and the public concerning the history and current operations of the Panama Canal. Also included are the maintenance cost of the visitors' observation sites in the Canal area.

Consultants and advisors - Provides for consultants for special studies, including Canal improvements and organizational studies.

Operations Direction

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Office of the Marine director	$ 682	$ 713	$ 745
Office of the Engineering and Construction director..........................	524	582	612
Office of the General Services director	808	846	883
Total operating expenses/obligations	$2,014	$2,141	$2,240

Operations direction provides for the bureau-level direction and coordination of the non-administrative activities of the Commission.

ADMINISTRATIVE AND GENERAL EXPENSES
Administrative Expense (Under Limitation)
Operations Direction (Cont'd)

Included in this function are the costs associated with the directors' offices for the various non-administrative Commission activities including the Marine Bureau, Engineering and Construction Bureau, and General Services Bureau.

Financial Management

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Operating expenses:			
Management information systems	$ 5,038	$ 5,298	$ 5,568
Accounting	3,887	4,150	4,322
Office of Chief Financial Officer, financial plan., budget mgmt., audit, systems, and treasury	3,607	3,790	3,967
Total operating expenses	12,532	13,238	13,857
Change in selected resources	36	...	...
Total operating obligations	$12,568	$13,238	$13,857

The financial management function is responsible for the development of financial, accounting and rate-making policies; development of financial systems and procedures; maintenance of the general books of account and the preparation of financial statements and reports; establishment of systems of internal control; conduct of comprehensive internal audits; collection, custody and disbursement of funds and related fiscal matters; and financial planning and manpower control.

Included in this function are the costs of such major activities as:

Management information system (MIS) - Responsible for establishing data processing related policy and guidelines, long-range planning for the Commission's data processing requirements and facilities, and direction of the activities of the Computer Operations Division, the Data Processing Systems Division and the MIS Technical Services Staff.

Accounting - Performs the accounting and related administrative and internal control functions for the Commission including the preparation of internal and external reports of financial condition.

Office of Chief Financial Officer, financial planning, budget management, inspector general, systems, and treasury. - The Office of Chief Financial Officer provides the financial direction and guidance for the Commission. The financial planning activity is responsible for rate-making policies and special financial studies. Budget management is responsible for the budget process, manpower control and liasion with the Office of Management and Budget. The inspector general activity is responsible for conducting comprehensive audits, maintaining liaison with the General Accounting Office and performing special audits as directed. The systems activity develops financial and accounting policies and reviews and maintains accounting and other financial systems. The treasury activity is responsible for collection, custody, and disbursement of funds, and liaison with the Department of the Treasury.

ADMINISTRATIVE AND GENERAL EXPENSES
Administrative Expense (Under Limitation)
Personnel Administration

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Operating expenses:			
Personnel administration	$3,014	$3,529	$3,679
Joint personnel program	761	817	864
Total operating expenses	3,775	4,346	4,543
Change in selected resources	-60	...	...
Total operating obligations	$3,715	$4,346	$4,543

This function has agency wide responsibility for personnel administration and management, and the joint personnel policy program that provides staffing services for participating federal agencies in the Panama Canal area on a cost-sharing basis.

Operating expenses include the cost of the following functions:

Personnel administration - Administers the personnel function of the Commission, including personnel policy development; employment and placement of job applicants; position classification, incentive awards, insurance and retirement programs; employee records management; and other employee services.

Joint personnel policy program - Responsible for performing central recruiting and examining functions for participating Federal agencies in the Panama Canal area on a reimbursable basis.

ADMINISTRATIVE AND GENERAL EXPENSES
Administrative Expense (Under Limitation)
Employment Costs

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Reimbursement to DOD for education and health care services	$ 4,875	$ 4,734	$ 4,605
Employer's contribution to FICA and Medicare	892	990	1,020
Employer's contribution to FEGLI	287	275	265
Employer's contribution to Federal employees health benefits (FEHBA and PSS)	8,016	7,885	8,165
Employees' home leave travel	1,497	1,567	1,597
Employees' recruitment and repatriation	1,118	940	995
Employees' motor vehicle transportation	100	109	114
Other employment costs:			
Equity adjustment additive	183	185	180
Commission unemployment costs	13	35	40
Employer's contribution to FERS and TSP	170	150	160
Total operating expenses	17,151	16,870	17,141
Change in selected resources	-207	...	...
Total operating obligations	$16,944	$16,870	$17,141

This category of expense covers certain employment costs of the Commission which are general in nature and not identifiable with other specific activities. Included are provisions for reimbursement to Department of Defense for education and health care services, the Commission's share of premium costs for employees' health benefits insurance, employees' home leave travel, employees' repatriation, certain other statutory employment costs, and an equity adjustment additive.

Other General Expense (Not Under Limitation)
Special Retirement Costs

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Amortization of special retirement costs	$ 15,144	$ 15,144	$ 15,144

Provides for the Commission's costs of amortizing the expense for the special retirement provisions, as described in Subchapter IV of the Panama Canal Act of 1979, Public Law 96-70. The estimate is provided by the Office of Personnel Management and is calculated on a "dynamic" basis considering future wage increases and cost-of-living increases in retirement annuities.

Interest Expense

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Interest expense	$ 13,878	$ 13,500	$ 13,100
Average interest-bearing investment (in millions of dollars)	$135,805	$133,202	$131,884
Percentage of interest rate	10.219	10.135	9.933

The Panama Canal Commission is required to include as a part of its operating cost the interest expense on the U. S. Government's net direct investment in the Panama Canal. The method for calculating interest expense is described in Section 1603 of the Panama Canal Act of 1979, Public Law 96-70. The rate used for determining the interest is the average coupon rate on outstanding marketable Treasury bonds in July of each year for the subsequent fiscal year. The average interest-bearing investment, the interest rate and interest expense are shown above.

Other General Expense (Not Under Limitation)
Other Expenses

	1989 Actual	1990 Estimate	1991 Estimate
	(Dollars in thousands)		
Revenue:	$ 360	$ 420	$ 441
Operating expenses:			
Personnel development program	$ 2,475	$ 2,660	$ 2,732
Death and disability	10,707	11,354	11,891
Alien cash relief payments and other related costs	1,259	1,160	1,060
Incentive awards payments	954	850	900
All other direct costs	1,207	477	369
Repatriation variation expense	-222	-300	-300
Other nonfund adjustments	1,313	...	...
Depreciation and other non-fund	-2,240	-2,607	-2,944
Total operating expenses	15,453	13,594	13,708
Unfunded adjustments to total operating expenses	1,149	2,907	3,244
Change in selected resources	1,306	...	...
Total operating obligations	$17,908	$16,501	$16,952

This activity comprises certain general expenses not assignable to other activities. Revenue is principally derived from services provided to other U.S. Government agencies by the joint personnel policy program, interest on delinquent accounts receivable and fees collected on bad checks.

Operating expenses include:

Personnel development program - Responsible for assessing overall training needs; developing and administering management and supervisory development; and operating of an industrial training school for apprentices. Special emphasis is placed on the need for training that will contribute to increased participation of Panamanians in all areas and at all levels of the Commission's work force.

Death and disability (Federal Employees Compensation Act - FECA) - Commission costs for job-related illnesses, injuries or death, as prescribed by the Federal Employees Compensation Act. Also includes liability for future payments under FECA. A separate interest-bearing fund has been established in the U.S. Treasury for deposits to cover all FECA-related payments including payments to be made after December 31, 1999. The Department of Labor is reimbursed annually from this fund for payments which they make directly to eligible Commission employees and/or survivors.

Other General Expense (Not Under Limitation)
Other Expenses (Cont'd)

Alien cash relief payments and related costs - Cash pension payments to former non-U.S. citizen employees of the Panama Canal who separated prior to October 1958 and therefore were not covered under the Civil Service Retirement System. Payments also include widows' benefits and periodic cost-of-living adjustments. Also includes the Home Care Program, formerly Annuitant Welfare Program, which provides a variety of services to aged former employees and their survivors who have meager incomes. Services include limited home medical care and other assistance as required. The Commission reimburses DOD for providing the medical services.

Incentive award payments - Costs associated with the employee recognition program which is designed to motivate and reward employee excellence through performance, suggestions and career service awards.

All other direct costs - Costs associated with political unrest and other miscellaneous services.

Repatriation expense variation (nonfund) - The expense or credit amount that results from an increase or decrease in the estimated repatriation liability.

Depreciation and other non-fund - Includes the depreciation credit for assets purchased with capital advance funds.

PANAMA CANAL COMMISSION
Detail of
Consultants and Advisors

Account Identification Number	Account Title	Type	1989 Actual	1990 Estimate	1991 Estimate
			(Dollars in thousands)		
95-0-4061	Operating Expenses	C			
	TOTAL		$437	$140	$173

The Panama Canal Commission consultant and advisor program is contained in the Executive Direction function. Consultant contracts are utilized in Transit Operations and also Administrative and General activities.

	1989 Actual	1990 Estimate	1991 Estimate
Transit Operations .... The funds in FY 1991 provide for consultant services in support of Canal modernization and improvement. These services contribute directly to Canal operational efficiency.	...	20	43
Administrative and General .... The funds in FY 1991 are for consultant services to provide expert advice and evaluation of a review of the tolls system; advice on vessel accident claims and other Commission litigation; Canal traffic forecasts; services in labor relations hearing cases. These services are essential to maintain efficiency and to comply fully with government regulations.	437	120	130
Total operating expenses	437	140	173
Change in selected resources................	-107	...	...
Total operating obligations	$330	$140	$173

PANAMA CANAL COMMISSION
Detail of Full-Time Equivalency (workyears)

	1989 Authorized	1990 Estimate	1991 Estimate
TRANSIT OPERATIONS:			
Maintenance of channels and dams	788	750	759
Navigation services and control	2,181	1,985	2,005
Lock operations	1,367	1,359	1,355
General repairs, engineering and maintenance services...	1,715	1,753	1,796
Fire and facility protection services	449	442	440
General canal expense	285	291	274
Total transit operations	6,785	6,580	6,629
SUPPORTING SERVICES:			
Logistical services	245	232	234
Motor transportation	354	347	348
Power system	134	129	129
Communications system	135	152	158
Water system	90	81	81
Housing	35	33	32
General support services	205	194	194
Total supporting services	1,198	1,168	1,176
ADMINISTRATIVE AND GENERAL:			
Under Limitation:			
Executive direction	256	233	233
Operations direction	48	47	47
Financial management	318	322	322
Personnel administration	143	150	149
Not Under Limitation:			
Personnel development	45	48	47
Other general corporate	20	20	...
Total administrative and general	830	820	798
Total full-time equivalency	8,813	8,568	8,603

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CAPITAL PROGRAM
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III. General Support Projects 38

New Obligational Requirement
(Dollars in thousands)

	1991 New Obligational Requirement
Transit Projects	$19,236
Utilities Projects	5,666
General Support Projects	5,098
Total Panama Canal Commission	$30,000

PANAMA CANAL COMMISSION
FY 1991 CAPITAL PROGRAM DETAIL
(Dollars in thousands)

(Obligational Basis)	Project Total
I. Transit Projects	
A. Transit equipment:	
1. Tugboat	$ 4,961
2. Other floating equipment	1,939
3. Other transit equipment	4,830
Total transit equipment	11,730
B. Transit facilities:	
1. Fire protection - locks	3,755
2. Other transit facilitiws	3,751
Total transit facilities	7,506
Total transit projects	19,236
II. Utilities Projects:	
A. Utility systems	
1. Electrical power and comunication systems	4,310
2. Water system	1,356
Total utilities projects	5,666
III. General Support Projects	
A. General support equipment:	
1. Replace motor vehicles	2,607
2. Other general support equipment	1,031
Total general support equipment	3,638
B. Commission buildings and facilities:	
1. Commission buildings	230
2. Supporting services facilities	568
Total Commission buildings and facilities	798
C. Other miscellaneous general support projects:	
1. Minor capital items	221
2. Advance engineering, planning and design	441
Total other miscellaneous support projects	662
Total general support projects	5,098
FY 1991 Capital Program	$30,000

1991 Project Justifications

I. TRANSIT PROJECTS (all dollars in thousands)
Total requirements for the Transit Project Group..... $ 19,236

A. Transit Equipment
Project requirement................................ $ 11,730

(1) Tugboats - This is a recurring project for the replacement of tugboats. The FY 1991 funds contemplate the replacement of the tugboat BURGESS. The vessel is an old, underpowered conventional twin-screw boat which lacks sufficient bollard pull in all directions to safely and efficiently handle the increasing number of broad beam vessels transiting the Canal. Current power and bollard pull requirements dictate that each tugboat should be omnidirectional/twin propulsion unit boats with a minimum of 3,000 horsepower and an average of 80,000 pounds of bollard pull. Furthermore, older tugs such as the BURGESS are high maintenance cost items. The new tugboat will be more efficient with enhanced maneuverability and greater suitability to handle current and future Canal operating requirements. The new tug will also impact favorably on the cost of continuing maintenance. FY 1991 funding required is $4,961.

(2) Other Floating Equipment - This recurring project provides for the replacement of that portion of the Panama Canal Commission's floating equipment fleet which is at the end of its economically serviceable life and costly to maintain. This equipment, such as launches, barges, buoys and pontoon cylinders, is essential to provide safe and efficient transit capability and also provide support to the ongoing maintenance of the channel. FY 1991 replacements of $1,939 include two (2) flat top pusher/work boats ($689), a pilot/boarding launches ($533), a work barge ($230), buoys ($211), a high speed launch ($161), and pontoon cylinders ($115).

(3) Other Transit Equipment - This project provides for the purchase and installation of tools and equipment required for the safe and efficient operation of the Canal. Marine operation requirements total $1,899 for FY 1991 and include such items as the replacement of the switchgear on Caisson No. 1 at Gatun, portable air compressors, locks miter gate sump pumps, a 5-ton deck crane and other miscellaneous machinery, tools and equipment for the Locks Division ($611); Marine Traffic Control (MTC) computer hardware/software, communications, CCTV, and traffic surveillance systems/equipment, and an uninterruptable power supply unit for the Traffic Management Division ($421); miscellaneous machinery, tools and equipment for towboat operations of the Canal Services Division ($143); upgrade of training equipment/simulators, automated information network equipment, and other small tools and equipment for the other marine operations of the Commission ($212). This project also provides for the addition of two aerial platforms and industrial type computer terminals at the locks ($512).

Maintenance and repair operations total $1,912 for FY 1991. These include the replacement of such items as telemetering systems, workboats, outboard motors, trailers, television transmitter equipment and other miscellaneous equipment for engineering, meteorological, hydrographic and survey operations of the Engineering Division ($445); small tool and equipment for the Electrical Division ($88); small boats, outboard motors, coredrilling rigs and equipment, machine tools, cranes, a pile extractor, portable skimmers, a 2,000 gallon water pollution vacuum truck and other miscellaneous machinery, tools and equipment for the Dredging Division ($655); four capstans, a portable milling machine, a hydraulic truck crane, welding manipulators, diesel welding generators, and other small tools and equipment for the Industrial Division ($578); and a D-4 bulldozer for the Maintenance Division ($146). Other transit operation requirements total $1,019 and include such items as security hardware/equipment ($755) for Canal installations and facilities; and firefighting equipment and other miscellaneous tools and equipment ($264).

B. Transit Facilities
Project requirement.................................. $ 7,506

(1) Fire Protection, All Locks - This nonrecurring multi-year project will provide a fire protection system at each set of locks, augmenting other firefighting systems. With the increasing size and number of transiting vessels carrying hazardous cargoes (oil, carbon, chemicals, gas, etc.), the locks require an accessible and dependable firefighting system. The system will provide a means to effectively fight a fire within the locks complex and avoid potential damage to locks facilities, machinery, locomotives, miter gates, controls and/or personnel. FY 1991 funding required is for $3,755 and provides a portion of the funding required for the installation of an independent water suction source at each lock wall at Pedro Miguel Locks, in addition to foam firefighting capabilities at ground and above ground levels.

(2) Other Transit Facilities - This recurring project provides for the rehabilitation, repair, replacement, improvement and addition to transit facilities of the Panama Canal Commission. These facilities support the transit function to insure the safe and efficient transit of vessels and effective support of all maintenance operations.

FY 1991 requirements for marine operations total $1,931. Locks Division requirements ($446) include such projects as a spare track, locomotive pit and component cleaning facility at the Locomotive Repair Facility, replacement of the welding shop at Pedro Miguel Locks, and other miscellaneous improvement projects. Canal Services Division requirements ($1,037) include addition of a passenger launch dock at Pedro Miguel, rehabilitation of the tugboat landing at Gamboa, and other miscellaneous improvement projects. Other Marine Bureau requirements ($448) include such items as relocation/rehabilitation of the Pilot Reporting Station at Diablo and miscellaneous improvements to Traffic Management Division and Maritime Training Unit facilities. Maintenance and repair operations requirements total $1,351. Electrical Division requirements ($211) include such projects as the addition of a line equipment shelter, extension of the Gatun machine shop roof, upgrade of sluice gate hydraulics at Gatun hydro station, and other miscellaneous facility improvements. Dredging Division requirements ($363) include such projects as the addition of a storage/office facility at the tug landing and fuel facilities, relocation/rehabilitation of the coredrill unit shed, and other miscellaneous facility improvements. Industrial Division requirements ($722) include such projects as the addition of an equipment storage shelter at the Launch Repair Facility, addition of a rollable structure at the Tug/Locks Miter Gate Repair Facility, and expansion of the equipment repair shop. Maintenance Division requirement ($55) is for upgrading the laboratory chemical storage facility. Other transit operations requirements total $469 and include such projects as the rehabilitation of Gatun fire station and miscellaneous security improvements to Commission buildings and facilities.

II. UTILITIES PROJECTS (all dollars in thousands)
Total requirements for Utilities Project Group.......$ 5,666

A. Utility Systems
Total requirements..................................$ 5,666

(1) Electrical Power and Communication Systems - This project provides capital funding for the electrical power and communication systems of the Panama Canal Commission. The electrical power system items procured under this project will insure power transmission versatility and dependability in addition to reducing possible equipment failure due to overload conditions. The equipment is

needed to serve high-peak demand and correct poor voltage and potential overload conditions in the high and low voltage system networks. Equipment procurements for the communications system will consolidate existing systems to permit the required separation of non-Commission subscribers, provide greater efficiency, reliability and versatility to the Commission system, and reduce requirements for maintenance and repair. Funding required for FY 1991 totals $4,310 and includes such items as upgrade of electrical service to the west bank ($551), replacement of microcomputer systems and equipment ($441), switchgear in Gamboa Raw Water Pump Station ($397), circuit breakers at Madden hydro ($397), Marine Bureau communications equipment ($331), microwave equipment ($325), power system and substation equipment ($221), integrated voice/data systems ($187), telephone system equipment ($176), communications test equipment ($165), data transmission equipment ($116), CCTV systems and equipment ($116), backup power systems at community sites ($110), electrical distribution equipment ($105), station service transformer at Miraflores ($99), control/relay testing equipment ($88), the addition of capacitor banks ($176) and other miscellaneous systems, tools and equipment ($309).

(2) Water Systems - This project provides funding for the water purification plants, pump stations, distribution pipelines and the chilled water air-conditioning system of the Commission's water utilities. Funding required for FY 1991 totals $1,356 and includes such items as replacement pumps and motors ($992), valves, meters and surge suppressors ($287), and chlorinators and alum feed pumps at water purification plants ($77).

III. GENERAL SUPPORT PROJECTS (all dollars in thousands)
Total requirements for General Support Project Group.. $ 5,098

A. General Support Equipment
Total requirement.................................... $ 3,638

(1) Motor Vehicles - This project provides for the replacement of overaged motor vehicles which have reached the end of their economic service life. Funding for FY 1991 of $2,607 provides for the purchase of 44 passenger carrying vehicles (including 20 large heavy duty sedans, 23 compact sedans and 1 ambulance) and 63 nonpassenger-carrying vehicles (including light, medium and heavy trucks and fire pumpers).

Large heavy-duty sedans are required for trans-Isthmian transportation of the pilot force. The new vehicles will essentially be of the same type, size and capacity as those being replaced and will be manufactured in the United States.

All vehicles being replaced will exceed the age and/or mileage standards prescribed by the General Service Administration (GSA) (CFR 48:101-38.402) at the time of replacement.

(2) Other General Support Equipment - This project provides for the procurement of small plant and equipment items that have reached the end of their serviceable life and are no longer economical to maintain. General Services Bureau requirements total $198 for FY 1991. Motor Transportation Division requirements ($142) include such items as a transmission tester, tire recap molds and other miscellaneous machinery, tools and equipment. Other General Services Bureau divisions requirements are for miscellaneous small plant and equipment ($56). The Commission's administrative and general staff function requirements total $833 and include such items as computer peripheral/on-line equipment and computer software packages for financial management operations, equipment for the apprentice training school, health and safety equipment, microfilm systems/equipment, graphics equipment and other miscellaneous items.

B. Commission Buildings and Facilities
Total requirement..................................$ 798

(1) Commission Buildings - This recurring project provides capital funding for the rehabilitation and improvement of approximately 153 structures and facilities under the administrative custody of the Buildings Management activity.

These miscellaneous rehabilitations, alterations and replacements are required to accommodate the essential needs of Commission units for day-to-day operations. Included in this capital project are such items, as the replacement of roofs, rehabilitation/replacement of various sized central air-conditioning systems as required due to obsolescence and projects to reduce the levels of energy consumption. FY 1991 requirements $230 provide for the renovation of Building 726 and for miscellaneous rehabilitation and repair projects in various other Commission buildings.

(2) Support Services Facilities - This project provides capital funding for support services facilities necessary for the efficient operation of the Canal. FY 1991 requirements total $568 for a flammable liquid storage and dispensing facility at Section I of the Logistical Support Division.

C. Other Miscellaneous Support Projects
Total requirement..................................$ 662

(1) Minor Capital Items - This item totals $221 and provides for replacements and additions which are unforeseen and/or too small to warrant separate listings and justifications. Approval of the Administrator is required for funding a project from this item.

(2) Advance Engineering, Planning, and Design - This project totals $441 and provides an authorization to be used for engineering, planning and design work on projects included, or to be included, in the Commission's capital program for subsequent fiscal years. This allows the detailed design effort to be completed in advance on projects selected for accomplishment so as to permit their timely advertisement, award and completion.

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